NEW YORK SEATTLE

MOTORSHIP

Devoted to Marine Oil Engine and Motor Vessels

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EXCLUSIVE technical and non-technical articles on design, construction and operation of oil-engines and motorships by the world's foremost writers on marine engineering.

MOTORSHIP

PROFUSELY illustrated with photographic reproductions of the newest designs in international merchant motorship and Diesel-engine construction and auxiliary equipment.

(Trade Mark Registered)

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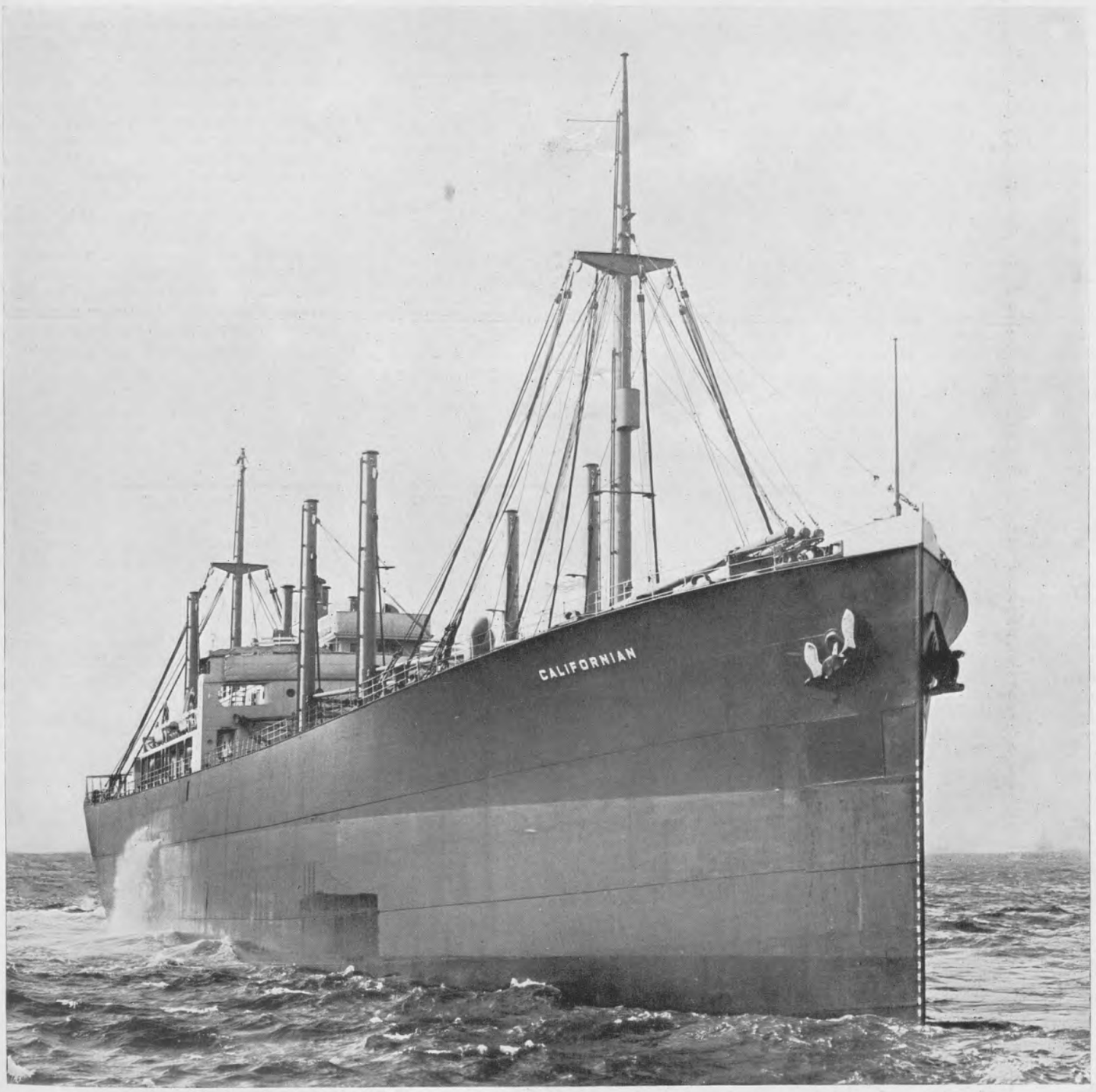


MAKE OUR USELESS STEAMERS VALUABLE

The Shipping Board has several hundred steamers lying idle with useless machinery, but with hulls in good condition which will not sell "as is." Something must be done with this fleet by the Board, which, though responsible, is trying to "pass the buck" to private capital (see page 416). Converting at least fifty to oil-engine power and electrical deck-machinery at a cost of between $30 and $40 per deadweight ton will give this country a fine fleet of economical motorships almost equal in earning power to the above splendid and successful Diesel-driven freighter of the United American Lines. There has been enough dallying. The time has arrived for action!

The Large Motor-Liners Now Building

Notes and Comments on Their Diesel Machinery and Other Arrangements

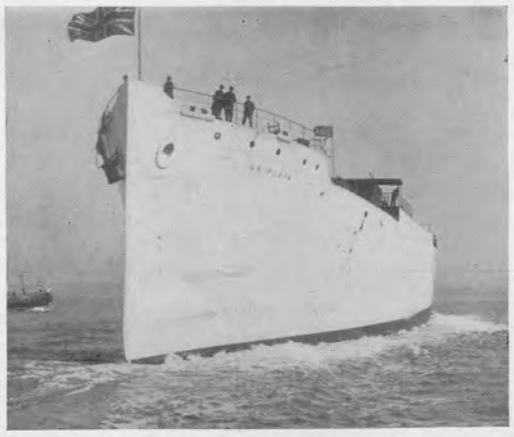
DETAILS regarding the various large Diesel-driven liners now under construction and listed on page 339 of our May issue have not yet been released in full, but we are enabled to give some additional notes regarding general arrangements of these most interesting ships.

Specific conditions have had considerable influence on the design of the large Diesel-driven passenger-liner now being built for the Union Steamship Company of New Zealand, in which four 3,500 shaft h.p. Fairfield-Sulzer two-cycle Diesel engines are being installed. She was the first order in the series of large motor-liners now under construction abroad; consequently, her builders were not inclined to take short cuts in the large number of problems they naturally met. Hence, the reason for four screws; simplicity being a matter worth studying, each engine has been coupled direct to the shaft. Three donkey-boilers are being installed, because most of the deck machinery will be steam-driven, although a large proportion of the auxiliary machinery below decks will be electrically driven, the generators being connected to auxiliary Diesel engines.

In appearance the new motorship will be very much like the steamship AOTEAROA, which was torpedoed and sunk during the war as the auxiliary cruiser AVENGER. She will have a straight stem, cruiser stern and two large stacks; incidentally, not unlike the S. S. NIAGARA, which is at present in the Company's service. The after stack carries the exhaust from all the main and auxiliary Diesel engines, while the forward stack leads up from the boiler-room and carries the smoke from the three donkey-boilers. Between the two stacks is a huge fuel-oil cross-bunker tank carrying sufficient oil for a round voyage.

In our May issue we referred to the report that two liners for which Harland & Wolff have received orders would have Diesel engines in conjunction with reduction gears. One of our British correspondents reports that reduction-gears will also be used on the motor-liner now building for the Swedish-American line at Armstrong's shipyard for which Burmeister & Wain are supplying double-acting, four-cycle Diesel engines. The engine builders have stated that these will be twin 6,750 shaft h.p. sets, but our correspondent says "there will be four engines geared to two shafts, very much after the system adopted with the later North German Lloyd flyers, which had their quadruple-expansion steam-engines geared on to twin shafts." In view of the information released by Burmeister & Wain, and because of our knowledge of their attitude towards reduction-gearing we feel that our correspondent must be mistaken.

"Ediba," Elder Dempster Company's third large motor-liner. She was built by Harland & Wolff and equipped with two 3,200 i.h.p. Harland-B. & W. Diesel Engines. Now on her maiden voyage



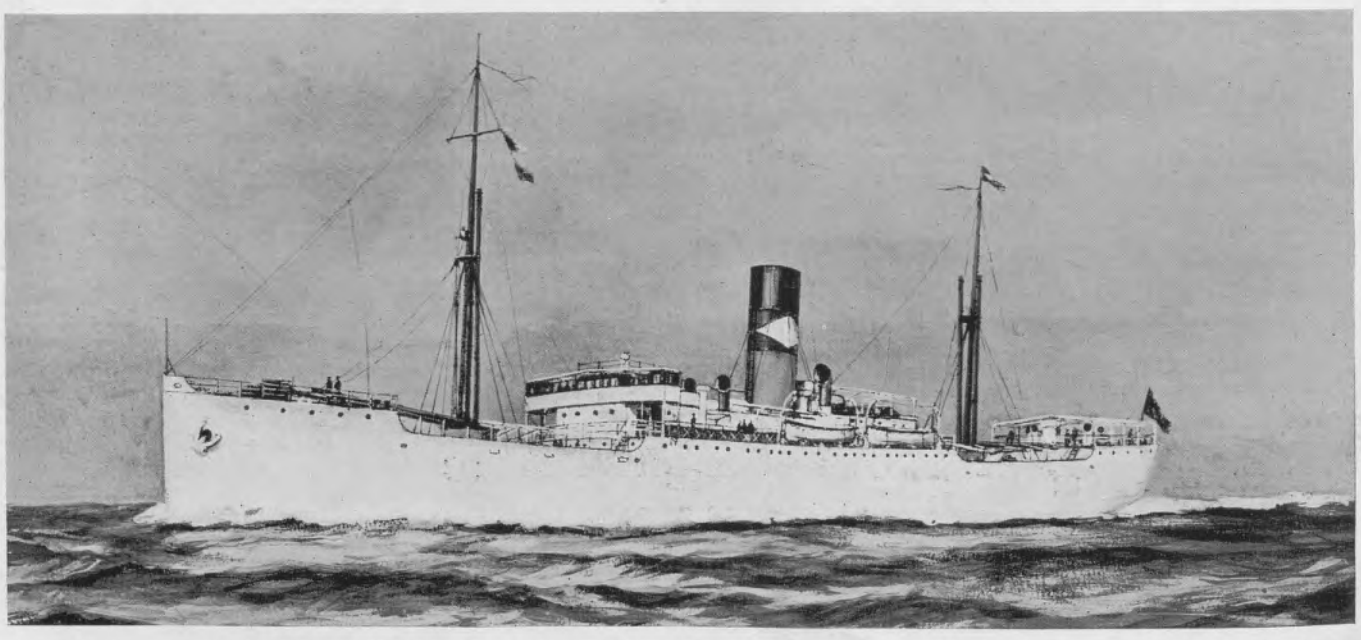
Launch of the Diesel-electric fruit and passenger carrier "La Plata"

According to the same correspondent, the two big motor-liners laid down at Belfast by Harland & Wolff (for which the Diesel engines will be built from Burmeister & Wain design at Harland & Wolff's Glasgow plant), like the Swedish-American Line's vessel, will have four double-acting Diesel engines geared to two shafts in the same manner. That reduction-gears are to be used for these vessels has been confirmed by another of our correspondents, and both these men are of important standing in the engineering and shipping industries. But if geared engines are installed no doubt they will be single acting.

It was in our May issue that we first reported that the two Belfast liners would have reduction-gears, so probably details of the installation of the vessels have become confused and only the Glasgow-engined boats will have reduction-gears. The latter will probably have fine hull lines so that between 16 and 17 knots should be attained. Except for heating the living quarters, steam will be completely excluded from these vessels, all auxiliary machinery on deck and in the engine-room being Diesel-driven. There will be a single stack carrying the exhaust-gases from the engines.

Although she cannot compare with the big motorships building in the British yards for the Swedish-American, Union of New Zealand and other companies, yet the North German Lloyd liner FULDA, building at the Weser yard, Bremen, will have the distinction of being the first large passenger motorship on the North Atlantic, and of course her builders and owners are making full use of the excellent publicity afforded by the fact. Considering the present circumstances of German shipping and the type of vessel which they bring into being, the FULDA is an exceedingly interesting ship and well worthy of attention.

Somewhat larger than the motor-liners which the British India and Elder Dempster lines recently placed in service, she will register some 9,500 tons gross, with dimensions of 459′ x 57′6″, and a load draught of twenty-eight feet. She will have seventy



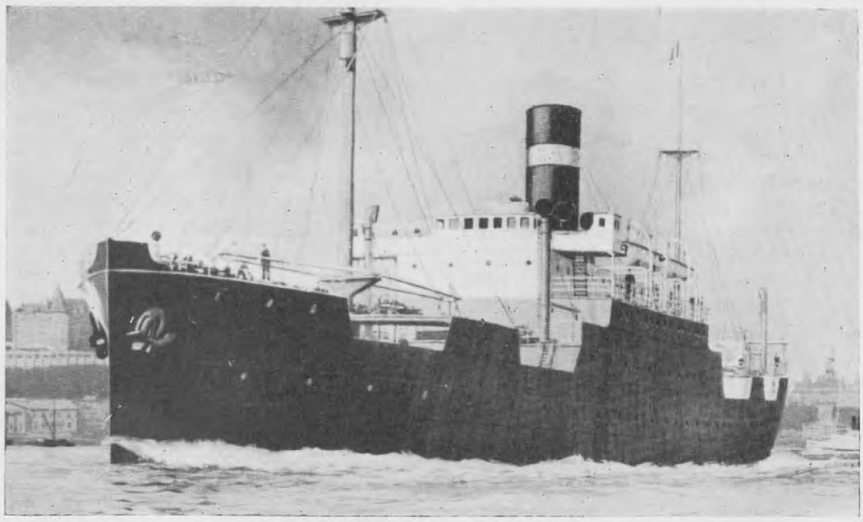
Reproduction of painting of United Fruit Company's new Diesel-electric driven passenger and fruit carrier "La Plata." She is one of three sister motorships building at Cammell-Laird's and probably will be run under a foreign flag, although for American owners

passengers in the first and second classes, much of which accommodation is interchangeable, as well as eight hundred emigrants in quite good quarters.

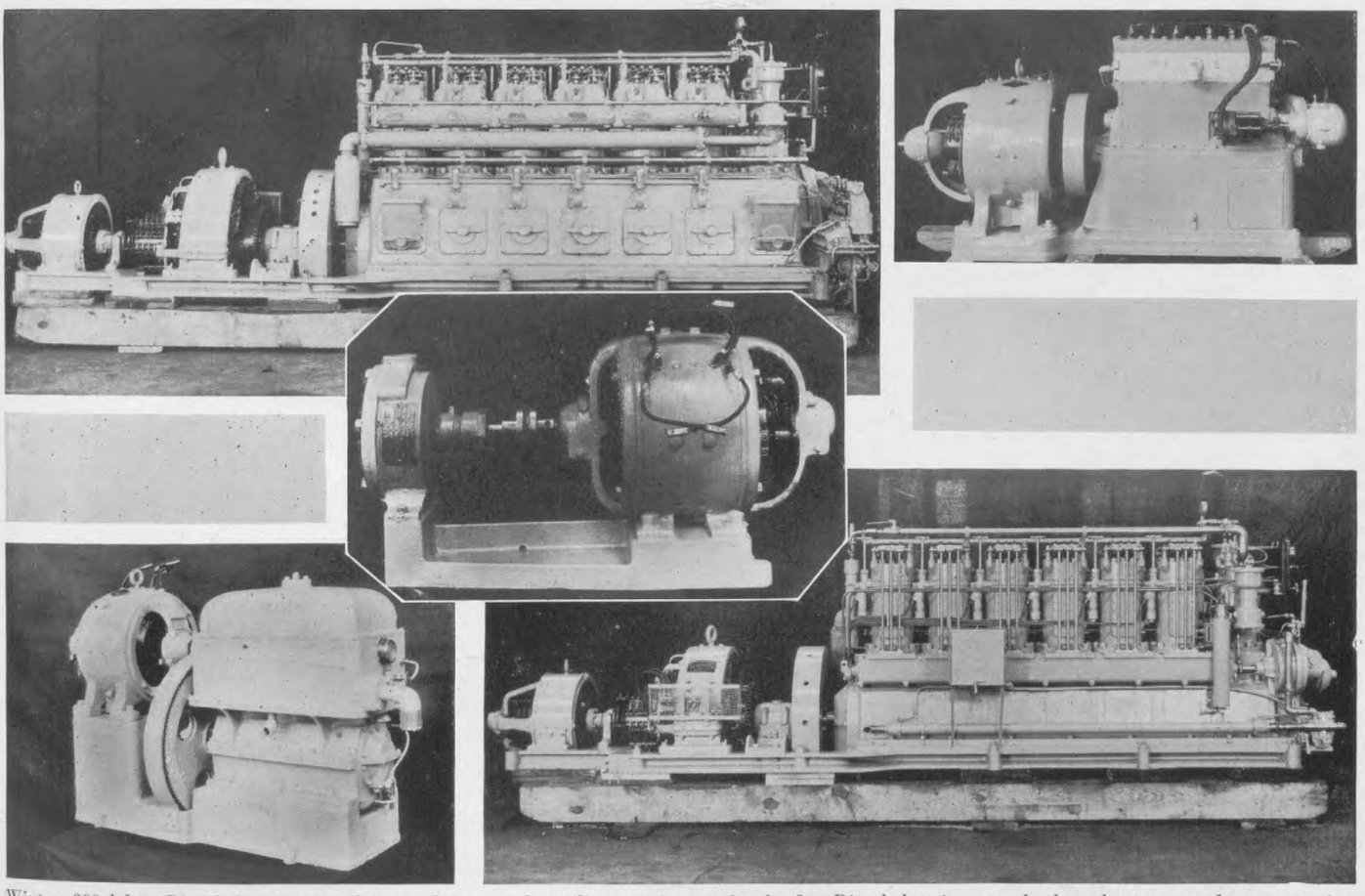
Her most interesting feature is the machinery, consisting of twin six-cylinder two-cycle Sulzer Diesels of 3,000 shaft horsepower each at 100 revolutions per minute maximum for continuous running. The standard cylinder of 680 mm. (26.77") diameter, with a 1,200 mm. (47.24") stroke, is employed and has already been tested in numerous ships with sea service. For her ordinary work they are to be run at eighty-five revolutions.

As with Sulzer practice, the controls are arranged on the cylinder-level platform so that the engineers in charge can have all the valves under their eyes. Two electrically-driven blowers will supply scavenging air, each being ample for both engines at sea speed, while an additional precaution is the fitting of two three-stage air-compressors to each engine, giving an ample surplus for maneuvring. At the normal speed of 12½ knots the fuel-consumption is expected to range between twenty and twenty-two long tons per day. All the auxiliaries are electrically driven, the main Diesel generators being in the engine-room.

The new ship takes the name of the famous old steamer FULDA of the same company, built on the Clyde in 1882 and for many years on the North Atlantic service alongside her sisters, the WERRA, EIDER and EMS—ships of five thousand odd tons, with a sea speed of sixteen knots, which they could exceed when necessary, but which burned a colossal amount of coal in doing it. In the late 'nineties her fuel bills were causing so much trouble that an attempt was made to sell her to the Spanish Navy as an auxiliary cruiser for use against the United States, but the deal fell through and she was then going to be bought by the Canadian Steamship Company for the fast service to the St. Lawrence which they projected. When she was put into dry-dock for examination, however, the blocks under her gave way, and in falling over she did herself so much damage that she was only fit to be towed home and scrapped in 1899.



The 7,100 tons d.w., 3,000 shaft h.p. Diesel-driven single-screw cattle liner building for the Donaldson Line by Vickers, Ltd., Barrow-in-Furness, England



Winton 300 b.h.p. Diesel-electric propelling machinery and auxiliary equipment for the first Diesel-electric stern-wheel tow-boat now under construction at the Charles Ward Engineering Works, Charlestown, Va., for the U. S. Engineers' Office of the War Department. For description see page 853, November, 1922, "Motorship." Plans were published on page 932 of our December, 1922, issue. Each engine is of 150 b.h.p.

Performance of Single-Screw Motorship "Pinzon"

Remarkable Economies Combined with Excellent Speed Are Shown

EXCELLENT results in operation have been attained by the single-screw motorship PINZON, owned by Mac-Andrews, Ltd., of London, in which a Beardsmore-Tosi Diesel engine is installed. As a complete description of this fruit-carrying vessel—and her sister PIZZARO—has already been given in this publication, we propose to deal only with her performance in operation under regular working conditions. She has been in service on the Spanish and Mediterranean routes of the owner. It will be noticed that at times over 11 knots speed has been averaged, but she was only designed and engined for a sea speed of 10½ knots.

Dealing with the first voyage of this ship; extremely severe weather was encountered, yet an average speed of over 9 knots was maintained across the Bay of Biscay, where a similarly powered steamship would not have averaged more than three-quarters of this speed; stokehold difficulties in the way of maintaining a reasonable head of steam in bad weather are too obvious to require detailed mention.

Since no boilers are installed in this ship, the cost of working cargo, of moving the ship about the harbor, or of standing-by awaiting orders, says *The Steamship,* is reduced to an absolute minimum. For instance, cargo can be worked from all the hatches throughout an eight-hour working day, the ship can be lighted during this period as required and pumps run as may be necessary, for a total consumption of fuel-oil of less than one-fifth of a ton.

Taking fuel oil at 72s. 6d. ($17.62) per ton, this means that the whole of the duties of this ship when working cargo can be performed for 14s. 6d. ($3.52) a day for fuel costs, whereas with a steamer of the same size the amount of coal consumed would be of the order of five tons, which at 22s. 6d. ($5.44) a ton gives 113s. ($27.20), or nearly eight times as much (Conversions quoted at $4.86 to the £1.)

To turn to the main consumption of fuel when at sea, records over a number of voyages now show that this ship will sail fully laden at 11.5 knots for a consumption of fuel per day for all purposes of under five tons, as against about four times this quantity of coal with steam, or, at the current prices for fuel quoted above, 362s. 6d. ($88.08), as against 450s. ($109.35) for coal. At the present time the M. S. PINZON is operating slightly more economically in respect of fuel consumption than on her first trip, due to the gradual bedding-in of piston rings and bearings to the normal running surface.

The few logs of direct runs from Liverpool to Barcelona given show the remarkably small variation of the revolutions per minute of the main engines over the whole period, excepting when in a strong tideway, as for instance, passing through the Straits of Gibraltar. During the last two trips which this ship has made, the average speeds for the whole run have been 11.06 (in bad weather) and 11.4 knots, and the direct run from Liverpool to Barcelona has been made at 11.6 knots.

FROM THE LOG: TWO EXTRACTS SUMMARIZED

Voyage: From Glasgow, via Liverpool, to Barcelona and other Spanish ports and return to Liverpool.

The PINZON left the Tail of the Bank (Clyde) at 7:10 P. M., September 19, 1922, and docked in Brunswick Dock, Liverpool, the following afternoon. Left Liverpool on September 22 and arrived at Barcelona on the 29th. Left Barcelona on October 3 for Liverpool, the following ports being visited on the Spanish coast: Tarragona, Valencia, Dernia, Alicante, Malaga and Huelva. Arrived Liverpool on October 17, 1922.

The total distance covered during this voyage was 3,894 miles, and the total time spent at sea 14 days 15.8 hours, giving an average speed of 11.06 knots.

Fuel used by main engine at sea, 72.75 tons.

Fuel used by auxiliary engine at sea, 2.0 tons.

Fuel used for working cargo, 3.05 tons.

Fuel used per 24 hours at sea, all purposes, = 5.097 tons.

Fuel used per I.H.P. per hour, all purposes, = .335 lb.

During this voyage strong head winds and seas were encountered.

Voyage: Liverpool to Barcelona and other Spanish ports and return to Glasgow, via Liverpool.

The PINZON left the Mersey October 21, 1922, and arrived at Barcelona on October 28. Left Barcelona for Liverpool on November 1, 1922, the following ports being visited on the Spanish coast: San Felice, Palamos, Valencia, Almeria and Cadiz.

Arrived Liverpool November 14, 1922, and Glasgow on November 17.

The total distance covered during this voyage was 4,241 miles, and the total time spent at sea 14 days 9.2 hours, giving an average speed of 11.4 knots.

Fuel used by main engine at sea, 76.54 tons.

Fuel used by auxiliary engine at sea, 2.1 tons.

Fuel used working cargo, 4.03 tons.

Fuel used per 24 hours at sea, all purposes, = 5.465 tons.

Fuel used per I.H.P. per hour, all purposes, = 0.328 lb.

During the run, Liverpool to Barcelona direct, the average speed worked out at 11.6 knots.

VICKERS-DIESEL GEAR DRIVE WITH BIBBY COUPLING

The first installation of the Bibby flexible coupling in conjunction with oil-engine drive was recently made by the Wellman Bibby Co. of London, England. This is a Rateau four-stage blower set, with a 300 b.h.p. Vickers oil-engine turning at 300 r.p.m. driving a Brown gear increasing the speed of the blower in the ratio of 1 to 10, and it is installed on one of the pneumatic grain elevators owned by the Port of London authority. There are two couplings, one between the engine and the gear-box, and the other between the gear-box and the blower. Incidentally, the Bibby coupling is being used on the first of the new giant X-type Diesel driven submarines now constructing for the British navy while Congress fails to provide funds for development of the new submersibles for the U. S. Navy.

With the Port of London's installation first placed in operation three years ago with ordinary-type couplings between the three units, considerable trouble was experienced with the gear through the fly-wheel effect of the blower impeller resisting the cyclic speed variations of the engine and thus putting severe stresses on the gear teeth. The blower naturally tends to run at a constant speed, but the engine fly-wheel apparently has a cyclic speed variation of 5 per cent. The result with the original couplings was that when the engine was accelerating, the forward torque in the transmission gear amounted to as much as four times the mean torque. When the momentum of the blower impeller was resisting the following retardation of the engine, a reverse torque about three times the mean was produced. The consequent reversal of stress in the gear was only naturally detrimental to its running and life. However, when the two Bibby couplings were fitted their resiliency absorbed practically the whole of the pulsations and the plant now runs quite smoothly.

LATE NEWS NOTES

For further development of Diesel engines the sum of £50,000 has been set aside by the directors of Richardsons, Westgarth & Co., Hartlepool, Middlesbrough & Sunderland, England.

It is expected that the Messageries Maritimes de France will shortly order a motor-liner of 10,300 tons displacement, 5,400 h. p. and 15 knots speed. Sulzer or Burmeister & Wain Diesel engines may be fitted.

An auxiliary sailing-ship with Scheldt-Sulzer Diesel engines has been ordered by the Rotterdam Lloyd from the De Schelde Co., Flushing, Holland.

An order for an 184 ft. cattle-vessel for the Red Sea trade has been placed by unnamed owners with Bow McLachlan & Co., Paisley, England, which will have Holeby Diesel-engines installed.

H. A. Magoun, senior vice president, New York Shipbuilding Corp., under whose supervision the New York-Werkspoor type of marine Diesel engine was recently constructed, has been elected president of the Atlantic Coast Shipbuilders' Association, whose offices are at Philadelphia, succeeding J. L. Ackerson, vice president, Merchants Shipbuilding Corp.

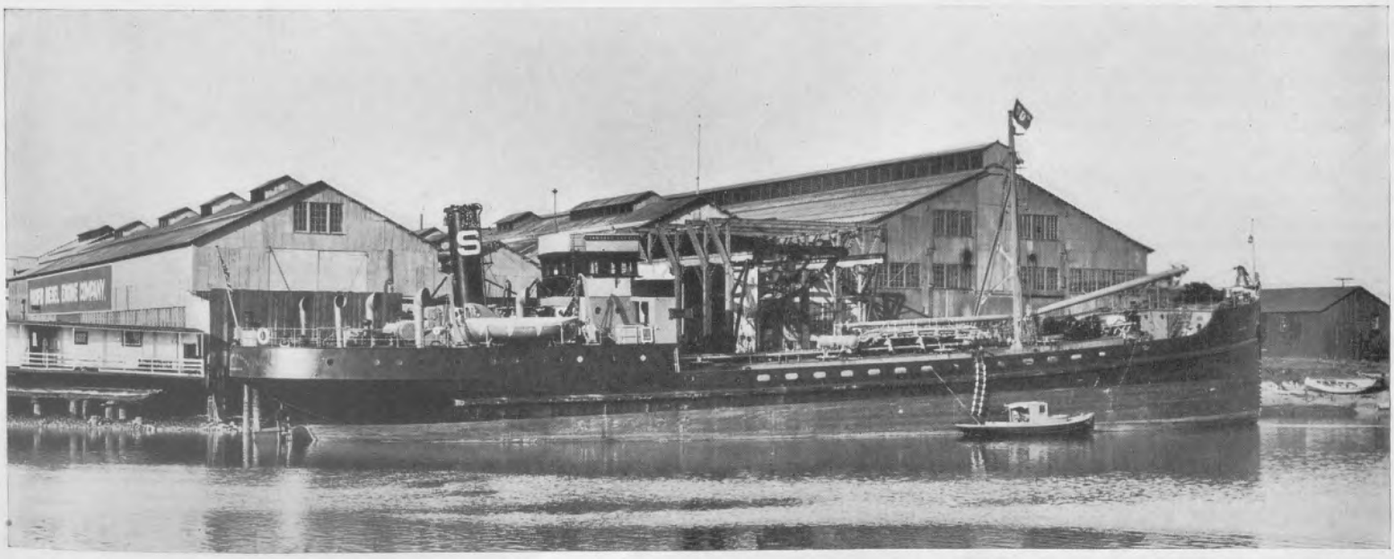
A Diesel engine of 200 b.h.p. will be installed in a 86′ pilot service boat ordered by the Dutch War Department from the Dordrecht Shipbuilding Co., Dordrecht, Holland.

World's First Sea-Going Diesel-Electric Tanker

"Standard Service," the first Diesel-electric tanker on her trial run, the results of which were given on page 345 of our May issue, as well as full details of this interesting motorship. A sister-vessel is on order

Illustrating method of quick removal of pistons by means of detaching the cylinder extension on one of the 500 b.h.p. Pacific-Werkspoor Diesel engines of the tanker "Standard Service"

Pilot house of the Diesel-electric tanker "Standard Service," showing the electric controls



"Standard Service" fitting-out at the dock of the Pacific Diesel Engine Co., who constructed her twin Werkspoor oil-engines. She is owned by the Standard Oil Co. of Cal.

Oil-Engines in Sheepshead Bay Craft

Large Fleet of Fishing Boats Rapidly Discarding Gasoline Engines in Favor of Oil-Engines—Big Savings Effected

SITUATED about 10 miles from the metropolis of New York, on the South Shore of Long Island, is Sheepshead Bay, one of the best known boating centres near the city. In fact, this fishing and yachting community is included within that great city's limits. Hundreds of fishing craft daily enter and leave this snug little bay throughout the year, while during the Summer months hundreds of pleasure boats are added to this fleet. Enclosing the waters of the Bay is a long narrow neck of land called Rockaway, where several thousand people make their homes the year round; many thousand more live here during the Summer months, going back and forth to their work in New York City. They require a certain and economical means of transportation, which they find in the boats of the Rockaway Beach Excursion Line.

Sheepshead Bay, Long Island, showing part of its fleet of fishing vessels

This passenger-boat service was originated about 20 years ago by Capt. H. T. Rigby and Capt. A. L. Jamieson, and has since been incorporated and reorganized, with P. Howard Reid, Jr., as president. As the first motor-boats were run this company took advantage of their economical power to transport the residents of Rockaway to the electric cars at Sheepshead Bay. As the New York subway system has been extended the number of people making Rockaway their home has increased so greatly that it is now necessary to maintain a boat service from 4.30 A. M. until 1 A. M. A boat leaves each place every five minutes on Sundays for the trip of 15 minutes and 15,000 people is a fair average for the number carried on the 10 boats of the fleet each Sunday during the warm months. Five to six thousand commuters are carried to the train connections each business day, and it can thus readily be seen that this boat service is a vital link in the transportation facilities of this part of the city.

The first oil-engine installation was made in the passenger-boat UNCLE SAM in October, 1921, this being a 60 h.p. Fairbanks-Morse engine, which is now giving excellent service. After noting the economy of operation of this oil-engine as compared with that of their various gasoline engines, the Rockaway Beach Excursion Line installed a 60 h.p. Fairbanks-Morse oil-engine in the NEPONSET. Having designed and built the above two boats and installed their engines, it was but natural that Capt. H. T. Rigby should install a Fairbanks-Morse oil-engine in his boat the BROOKLYN to replace the gasoline-engine. She is of the modified "skipjack" model, which produces an easily driven form of hull, an exceptionally dry and stable sea boat.

She is 65'0" length on deck, 15'0" breadth, 4'0" draft, 35 tons gross and 24 net tons and is engaged in the party fishing business for about nine months of the year. Her steering wheel is of solid brass, and was presented to Capt. Rigby by W. K. Vanderbilt, the New York millionnaire, having been used on one of his yachts. The BROOKLYN is a one-man boat, with controls led to the pilot-house from the engine installed in the aft end of the boat. This engine swings a 38" x 40" three-blade Columbia bronze propeller at 410 r.p.m., driving the boat at 9 knots speed. An auxiliary Bull Dog single-cylinder kerosene engine drives an electric motor and a Curtis 4" x 4" air-compressor for providing starting-air at about 150 lbs., although the main-engine starts on as low as 60 lbs. pressure.

Captain Rigby kept a careful record of fuel and other expense with both engines, with the following results. With the six-cylinder gasoline-engine installed, the fuel consumption from May 1st, 1921, to January 1st, 1922, was 5,505 gallons of gasoline at a cost of $1,745.30 and 229 gallons of lubricating-oil at 70 cents per gallon, costing $160, or a total cost of $1,905.60 for a running time of 612 hours. The first trip with the Fairbanks-Morse oil-engine was made on May 1st, 1922, and from that date until January 17, 1923, the fuel-consumption was 2,820 gallons of fuel-oil and 350 gallons of lubricating-oil for 705 hours of running, a total cost of $498. At this annual saving of $1,407.60 the oil-engine will pay for itself in three years. Captain Rigby advises us that the above does not take into consideration the saving in the cost of spark-plugs, batteries, wire and delay because of trouble with the former engine. Also the oil-engine ran about one hundred more hours on the quoted fuel consumption.

Following the installation in the BROOKLYN came that of a 100 h.p. Fairbanks-Morse oil-engine in Captain Dick Pearson's party fishing-boat ROSE R 2ND, running out of Sheepshead Bay. She is 56' 0" long, 17' 0" breadth and 5' 7" draft, and her engine swings a 44" × 48" propeller, which drives the boat at about 9 knots. Shortly after Captain Fred Wrege installed a similar engine in his party fisherman EFFORT 2ND, which is 64' 0" long, 17' 4" breadth and 5' 0" draft. A 42" by 48" propeller drives her at 9 knots, and her operation has been so successful that Captain Wrege is now having an 80 ft. oil-engined party fishing-boat built by the Nyack Shipbuilding Corp., Nyack, N. Y.

Party fishing-boat "Comanche," which is having an Atlas-Imperial oil-engine fitted

All the above fishing-craft installations were in boats in which fishing parties are taken out to the fishing banks for an all day fishing trip. Plying out of Sheepshead Bay are several "bunker fishermen" who bring their catch to market. Among them are the AMANDA BISHOP, owned by Capt. Ben Bishop of Patchogue, L. I., and the ELEANOR A. WARNER, owned by Capt. Chas,

Warner of Blue Point, L. I. The former craft is 74′ 5″ length, 20′ 0″ breadth, 5′ 4″ draft, and is equipped with a 60 h.p. Fairbanks-Morse oil-engine, giving her a speed of 10 miles light. Her propeller is 41″ diameter and 30″ pitch. Capt. Warner's boat is 60′ 0″ long, 20′ 0″ breadth and 6′ 0″ draft, and her 60 h.p. Fairbanks-Morse engine drives a 44″ × 34″ propeller, giving the boat a speed of 11 miles light. The fish which these "bunker fishermen" bring in are used in the manufacture of fish-oil.

Up to December, 1922, there were no Diesel-engine driven craft on Sheepshead Bay. The first Diesel-installation was that of an Atlas-Imperial engine in the Rockaway Beach Excursion Line passenger-boat C. WASHINGTON COLYER, which was

Capt. Rigby's party fishing-vessel "Brooklyn"

formerly equipped with a 75 h.p. gasoline-engine. This wasteful power plant was removed and the Diesel-engine installed. This boat is of wood construction and was built by Bell, Wallace Co., Morehead City, N. C., in 1913, and is 65′ length over all, 20′ breadth and 6′ draft. She is typical of the best design of passenger craft which the

Capt. H. F. Rigby's Sheepshead Bay passenger boat "C. Washington Colyer," built about ten years ago, but recently fitted with an oil-engine

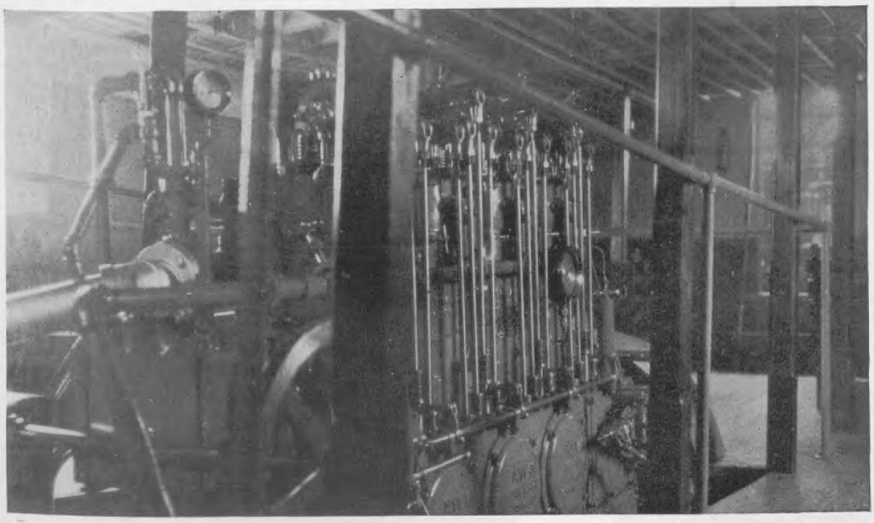
internal-combustion engine has rendered possible. The pilot-house is very short, just sufficient for the use of the "operator"; we use this word advisedly because one man steers the boat and operates the engine by means of an ingenious system of controls led from the engine forward under the floor. A door leads from the aft end of this pilot-house on the center-line immediately into the passenger cabin, in the center of which is the 90 brake h.p. four-cylinder 8½″ × 12″ Atlas-Imperial Diesel engine. It is surrounded by a railing only and the exhaust is led out aft under the flooring, so that practically the total area of the lower deck and the entire area of the upper deck is available for passengers, 300 being carried when fully loaded.

Her pilot-house controls are of particular interest, consisting of a 16″ dia.-horizontal wheel having a vertical shaft which passes down through a column on which is mounted a horizontal steering wheel below the above wheel which operates the clutch. At the lower end of the shaft is a connection for control-rods leading aft 30′ to the clutch on the engine, while the steering leads are connected to the column by a five-to-one gear. Under the pilot-house is located a 5 h.p. 4″ × 5″ single-cylinder kerosene-engine driving a 3½″ × 5″ air-compressor, which, however, has only been used once—when charging the starting-air tanks for the initial starting of the engine when it was first installed about four months ago. The location of this air-compressor appeared somewhat inaccessible to us upon inspecting the boat until its infrequent use was referred to.

The engine is installed on a very rigid engine-bed of 12″ × 12″ oak fore-and-aft timbers 40′ long and vibration is practically nil. Forward of the pilot-house under the deck is a fuel-tank of about 250 gallons capacity, Standard Oil Co. Diesel-oil of 24 to 28 degrees Beaumé being the fuel used. Less than three gallons per hour is the fuel-consumption, while one gallon of D. T. E. medium-heavy lubricating-oil suffices for 15 hours' operation. A three-blade 48″ × 46″ bronze propeller drives the boat at 10 knots. Her former 75 h.p. heavy-duty gasoline-engine drove her 7 knots. The cost of operation has been reduced from $2.55 per hour to only 32 cents per hour, which indicates that the life of gasoline engines in commercial use is bound to be extremely short, as none can afford to waste money on fuel.

Early in February the C. WASHINGTON COLYER towed the party fishing-boat R. C. LUNDY, owned by Capt. Anton Lundy, to a Brooklyn dock at which the American-Hawaiian Steamship Co. steamer KENTUCKIAN was lying and a 90 h.p. Atlas-Imperial Diesel engine was lowered into the LUNDY's hold. This engine replaces a 135-h.p. gasoline engine. Another party fisherman in which an Atlas-Imperial Diesel

(*Continued on page* 435)



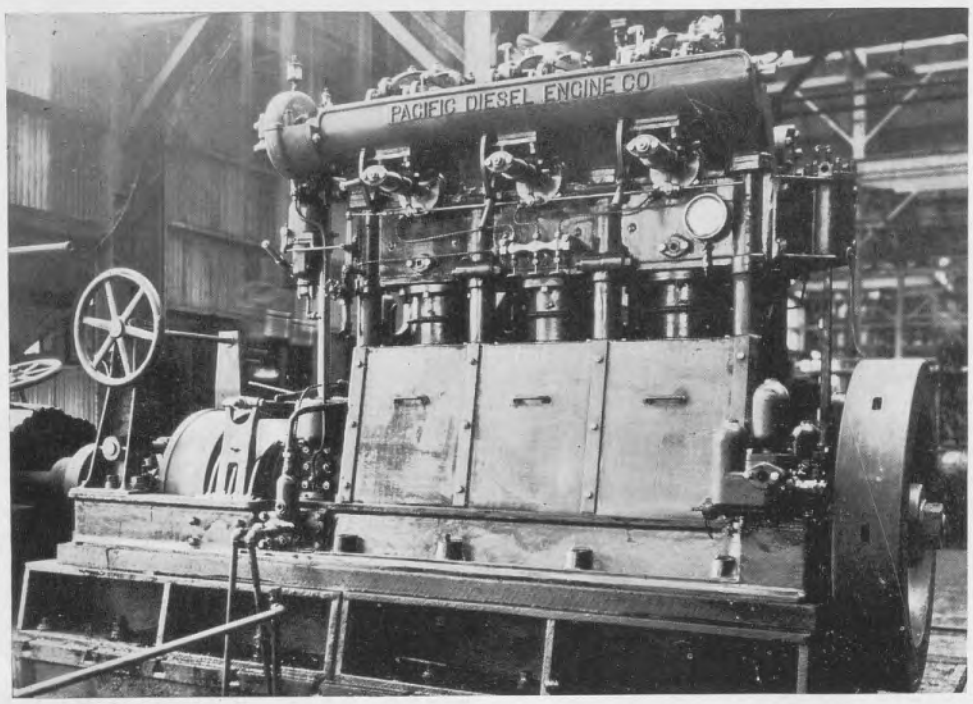
Atlas-Imperial oil-engine in Sheepshead Bay passenger ferry "C. Washington Colyer"

Motor Tugs for British Columbia

Some Recent Installations of Pacific-Werkspoor, Atlas-Imperial, Fairbanks-Morse, and Frisco-Standard Oil-Engines

AS ALONG other parts of the Pacific Coast, the oil-engine is making steady headway displacing gasoline and steam machinery for work-boat propulsion in British Columbian craft. While the surface-ignition type of oil-engine has long been in use in the local work-boat field, Diesel-engines up to the present time have not made great headway, but three tug-boats are now being equipped with this type of power at Vancouver, so this season is seeing the introduction of the Diesel engine in the British Columbia tow-boat field.

Some of these installations have been recorded in recent issues, and we are now able to give some information concerning a few of the additional orders that have just been placed by tow-boat owners on the west coast of Canada, although the following is far from representing all the new installations.



The new three-cylinder 100 b.h.p. airless-injection type Pacific-Werkspoor Diesel engine built by the Pacific Diesel Engine Co., Oakland, Calif., for work-boat installations

Now under construction at the Vancouver shipyard for Young & Gore of the same city is the 85′ tug SEA WAVE from designs by T. Halliday, in which a four-cylinder, four-cycle 200 shaft h.p. Pacific-Werkspoor Diesel engine is being installed. This plant when turning at 225 r.p.m. should give the boat a speed of 9 knots light. It swings a four-bladed, 6′ 6″ diameter by 6′ pitch propeller of 15 sq. ft. area of the adjustable blade type.

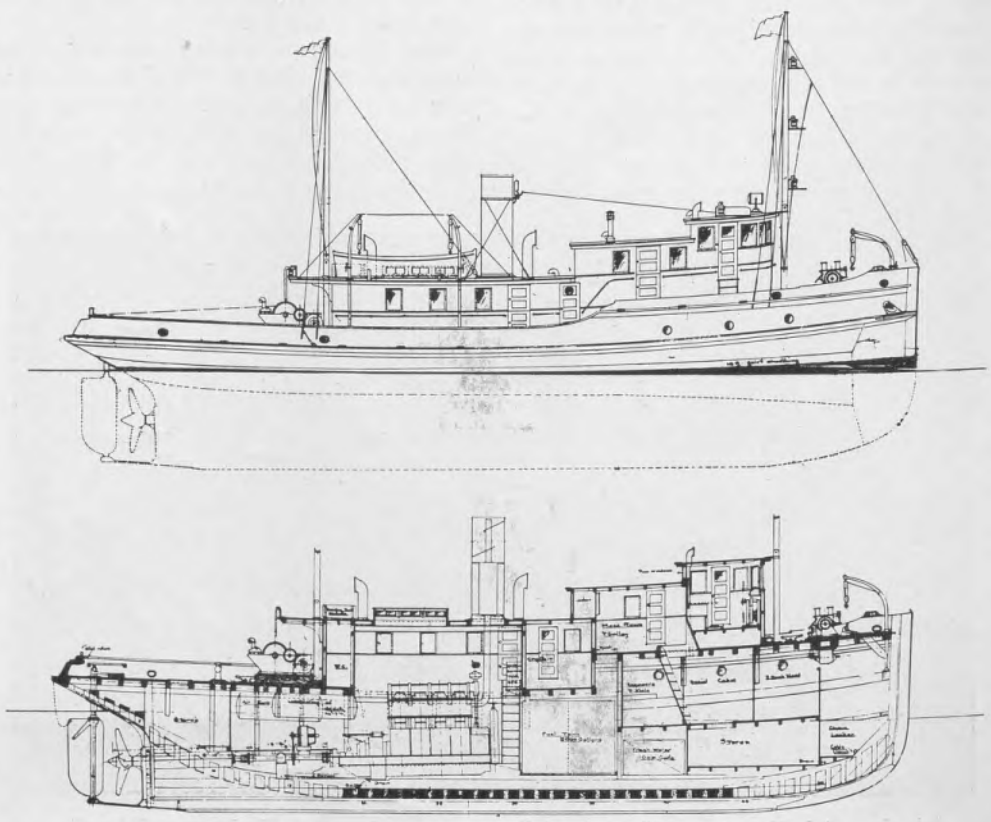
It is interesting to record that the owners of this new vessel are captain and chief-engineer, respectively, of the 135′ steam-driven tug SEA LION, which they operate in partnership in the log-towing business on the British Columbian coast. Consequently it is very pleasing to see they have turned from steam to economical Diesel oil-engine power. Their new boat has 19′ beam, 10′ depth and 9′ 8″ draft. Log towing on this coast has developed a very sturdy type of vessel. Their new boat is constructed of local fir.

Under the raised-deck forward is accommodation for two deck-hands, abaft which is the chief-engineer's cabin, as well as a cabin for the second-engineer and mate. In the deckhouse is the captain's cabin, galley and provision store-room. Below the captain's cabin and forward of the engine-room there are fuel-tanks with a capacity of 5,000 gallons.

As no cargo is carried ample space has been given to the engine-room. In addition to the 200 b.h.p. main Werkspoor Diesel-engine there is a 16 b.h.p. Werkspoor Diesel engine directly connected to a 10 k.w. generator for auxiliary power; this engine also operating a two-stage air-compressor. On the propeller shaft there is a 6¾ k.w. generator used for charging a 65-cell, 110-volt battery system for operating the deck machinery and pumps. The latter is a centrifugal general-service pump with a capacity of 210 gallons per minute at 117′ head. It is driven by a 10 h.p. electric motor. For steam heating there is an oil-fired furnace. There is a stack on the vessel, to which the exhaust-gases are carried via a Maxim silencer. On deck there is an electrically-operated windlass, capable of lifting a 900-lb. anchor and 30 fathoms of chain hanging straight down; while the electric towing-winch has sufficient power to pull the tug backwards against the full-speed of the engine. In addition to a 3,000-c.p. searchlight, a wireless telephone apparatus is installed.

"Radio," a 55′ oil-engined tug in service at Vancouver

The SEA WAVE has been classified by Lloyds. With her large fuel capacity and economical consumption of not over 0.43 lb. per shaft h.p. hour, her cruising



An 85′ Vancouver tow-boat in which is installed a 200 b.h.p. Pacific-Werkspoor Diesel engine

radius is expected to be 22 days at full power. So she should be particularly well suited for the long distance towing jobs frequently offered on this coast. She should be ready end of May or early June.

With further regard to the other two tugboats recently ordered by prominent Vancouver men to have Diesel power, the RADIO is the first to be actually placed in service, having gone into commission during the past spring since when she has produced much favorable comment. The RADIO was built at Vancouver by J. Moscrop for Captain J. A. Cates. She is 55′ long, o. a., 14½′ breadth, with 7½′ draft, and is propelled by a four-cylinder, 90 b.h.p., four-cycle type Atlas-Imperial Diesel engine. which turns a 56″ diameter by 30″ pitch propeller at 350 r.p.m. As will be realized, she is a smaller boat than the SEA WAVE, but her fuel-capacity, being 1,600 gallons, is sufficient for over two weeks' operation at full power. She carries a crew of three, and at present is being used principally for harbor work at Vancouver. For pumping out scows or fighting fire she has a centrifugal pump with a capacity of about 500 gallons per minute at 50 lbs. pressure. This unit is connected to the main engine.

In the camp tow-boat STARSTON, 46′ length by 11′ breadth, owned by the Merrill Ring Lumber Company, a 45 b.h.p. Fairbanks-Morse surface-ignition oil-engine has been installed. Surface-ignition oil-engine power is replacing the old steam engine in the tug PORT ALBERNI. This craft is 65′ long and is having a 75 b.h.p., three-cylinder, two-cycle Frisco-Standard surface-ignition oil-engine installed.

Operation of Motor-Tug "Fred Ball"

Successful Results from Her Frisco-Standard Oil Engine

HIGHLY satisfactory service, at costs which represent an economy of 80 per cent. as compared with distillate-driven craft, is being given by the tug FRED BALL in the difficult conditions of towing work in the lower Sacramento River and San Francisco Bay. This boat, built by Nunes Brothers of Sacramento, California, and powered with a 110 b.h.p. Frisco-Standard oil engine, has been in virtually continuous operation since November 15, 1922. Since installation of the engine it has not been necessary to make an adjustment of any engine part. This in spite of the fact that Fred Ball, owner and operator of the boat, had had little or no experience with engines using heavy oil previous to his operation of this craft.

The FRED BALL is designed purely for towing service, without any of the accommodations for passengers or package freight which were common in tugboats around San Francisco Bay until a few years ago. She is 65′ in overall length, has a beam of 16′ and draws 7½′. The combination of her lines, trim, propeller and power is such that she has a normal speed of 11½ knots.

The boat's propeller is of the regular design of the Standard company, of bronze, 56″ in diameter by 44″ pitch. The craft has pilot-house control, except for reversing the direction of the engine—ordinary maneuvering is accomplished by a mechanical reverse gear. She carries but one man beside her captain. Her engine is a three-cylinder, two-cycle unit, turning over at 300 r.p.m. Ignition of the fuel is by a hot-bulb, except in starting, when electric plugs are used. The efficiency of the installation is such that the engine can be started from cold in less than one minute. The plugs, which are merely glow coils of resistant wire, are heated by turning into them the current from a six-volt Exide storage battery, which in turn is kept charged by a generator on the engine. As soon as the engine is started the current heating these plugs is turned off.

Starting air is provided for this engine in two storage bottles, 22″ in diameter by 84″ long and 18″ in diameter by 60″ long, giving a total storage capacity of approximately 27 cubic feet. These are charged by a compressor on the engine. But there is an auxiliary Rix compressor, driven by a 5 h.p. gasoline engine, which can charge both bottles to their normal pressure of 200 pounds per square inch in twelve minutes.

The engine has two starting cams on a sleeve, one designed for starting in the ahead direction and one for the astern direction, either of which can be slipped into position with little effort. This enables the craft, when it is necessary to go astern for a considerable distance, to eliminate the loss of power attendant upon reversing the propeller through the mechanical gear. But to reverse the direction of the engine it is necessary to go to the machine itself; propeller reversals through the gear are accomplished by the navigator from the pilot-house, so that the boat maneuvers and docks easily.

There are two systems of lubrication on the engine. Oil is supplied to the cylinder walls and pistons through a Madison-Kipp lubricator, and this oil is not reused, but travels down to a sump. The main bearings, however, are lubricated by a stream of oil kept moving by a circulating oil-pump on the engine itself and this oil is used repeatedly. As a result the engine's consumption of lubricating oil is very low and the supply of oil to the main bearings always is clear and clean, uncontaminated by any possible impurity from cylinder or piston-walls. In fact, oil consumption as shown by operation to date is about one gallon for each 500 h.p. hours, or one gallon for each five hours of engine operation.

Fuel oil consumption approximates 7½ gallons per hour of operation. Captain Ball has advised the engine builders that, compared to the cost of distillate fuel used in a slightly smaller boat in similar service, the FRED BALL has a fuel bill of about one-fifth, a clear saving of approximately four-fifths.

The lighting system is supplied by a 38-volt, six-tenth kilowatt Robbins & Myers generator, which charges a storage battery whence current can be supplied when the power plant is not running. This generator is belted to the main engine.

Also capable of connection to the main engine, or to the small auxiliary engine already mentioned, is a centrifugal gear-driven pump controlled by a friction clutch and capable of use as a bilge or auxiliary pump. The main circulating pump, of the plunger type; the circulating-oil pump, and an oil filter, and a fuel-oil transfer pump for moving fuel from the storage to the day tank, are built into the engine proper.

The boat is of wooden construction and was run from Oakland to Sacramento, after her engines had been installed, before her deck houses were fitted.

"Louise," a 50′ tug powered with a Mianus oil-engine

OIL-ENGINED TUG FOR PHILADELPHIA

A motor-tug for the Philadelphia Paper Manufacturing Company under construction by the Rancocas Construction Company, from designs drawn up by J. Murray Watts has been previously referred to. This vessel has recently been completed and named LOUISE. She is a 50-footer with 12′ breadth and 4′ to 4′6″ loaded draft, and is equipped with a three-cylinder Mianus heavy-oil engine turning a 40″ diam. propeller. Controls from the engine-room are carried to the pilot house in order that one man can both steer the boat and handle the engines.

Ample space has been given to the engine-room, there being about 7′ headroom and plenty of space all around the main engine. In addition to the latter there is a Mianus air-compressor equipment, a 32-volt electric lighting plant and a 3½″ rotary wrecking pump.

Regarding accommodation, there is a berth in the pilot-house for the captain and cabin bunks for two below decks. The main work of this boat will be towing four 97′ by 17′ barges. It is interesting to note that the builders are now constructing a duplicate tug to their own order. The hull is constructed of 2″ pine planking on 4″ by 6″ white oak frames. The keel is of 12″ white oak with two 6″ keelsons.

The Diesel-driven tug "Fred Ball."

MOTORSHIP

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CONVERSION OF SHIPPING BOARD VESSELS

WORK on the inspection and classification of those cargo-vessels of the United States Shipping Board that must of necessity be converted to Diesel power before they can be placed in service, has recently been completed under the supervision of Captain Bookwalter and A. Conti. But owing to the absence of a definite Shipping Board policy the date for the third meeting of shipbuilders, engine manufacturers and electric-equipment makers, which was to be held at Philadelphia, has not yet been announced. Because Chairman A. D. Lasker is resigning and Edward P. Farley of Chicago is taking his place, we should not be at all surprised if further action was postponed until Mr. Farley has taken over the wheel. It is very curious that on every occasion that the Board has been "going to do something" in the way of motorship construction or conversion a new Chairman has been appointed and the plans pigeonholed. This has occurred from the days when Wm. Denman, the first Chairman of the Board, was in power. He, it will be recalled, was forced to resign on the day he was to have signed a contract for the construction of a fleet of 24 steel motorships at the Cramp shipyard. This he afterwards stated before Congress. Disagreement with General Goethals over the wooden ship program was given as the reason for the resignation, but actually Denman and Goethals were in complete accord regarding wooden vessels.

Probably by the time Mr. Farley has served his term of office and is ready to resign, the Shipping Board will have "another proposition on hand" to encourage the construction of oil-engined vessels. Meanwhile it would be interesting to know if the silent influence still working against the economical oil-engine really is strong enough to dethrone Chairmen of the Board when practical motorship programs are about to commence. It was not long after writing his Coal Oil Johnny article, and after declaring in his book on merchant shipping that a successful American Merchant Marine was impossible if Diesel engines were not adopted, that Chairman Edward Hurley withdrew from all maritime connection. About the same time Rossiter's plans for a modest fleet of new motorships was "killed" following his resignation from an important position with the Board. These are but several of the instances we have in mind.

STEAMERS SOLD FOR CONVERSION TO DATE

Name	*D.W.T.*	*Type*	*Purchasers*
SEEKONK	7,825	Cargo	Wm. Cramp & Sons Shipbuilding & Engine Co., Philadelphia, Pa.
ASHBEE	5,740	Cargo	New York Shipbuilding Co., Camden, N. J.
JACKSONVILLE	5,732	Cargo	New York Shipbuilding Co., Camden, N. J.
MAGUNKOOK	6,000	Cargo	Moore Dry Dock Co., San Francisco, Cal.
COVEDALE	4,125	Cargo	Munson Steamship Co., 67 Wall St., New York
COURTOIS	4,125	Cargo	Munson Steamship Co., 67 Wall St., New York
LAKE SUNAPEE	2,922	Cargo	W. J. Gray Co., 310 California St., California
BIDWELL	10,254	Tanker	Sun Shipbuilding Co., Chester, Pa.
MILLER COUNTY	10,254	Tanker	Sun Shipbuilding Co., Chester, Pa.
CHALLENGER	11,850	Cargo	Sun Shipbuilding Co., Chester, Pa.

Existence of a market for converted steamers is fully evident from the fact that up to the present time, without any definite selling, conversion or operating policy being laid-down by the Shipping Board, the vessels tabulated above have been sold to Americans with guarantees from the purchasers to convert them to Diesel power.

An annual fund of twenty-five million dollars was voted for five years for new motorship construction, but owing to failure of the last Congress to enact further merchant-marine legislation this fund is not available for loaning to shipowners for conversion purposes. When Congress resumes, endeavors should be made to correct this situation. Meanwhile we see no legal reason why the Shipping Board cannot convert as many of these freighters as they desire, in the same way that they have spent millions reconditioning passenger-liners. "Reconditioning" covers new machinery where necessary.

While we believe that strong objections would be raised from some quarters if the Shipping Board pro-

Mr. Farrell and Steamer Conversion

DISCUSSING the shipping situation of the world in an address before the tenth National Foreign Trade Convention, James A. Farrell, President of the U. S. Steel Corporation, declared that "a third of the Shipping Board's fleet of ships, by virtue of misfit machinery or equipment, will not find purchasers in their present state. *These particular units*, whilst of no operating value as they are, will yet *afford the Board a means of taking the most progressive single step in keeping our merchant-marine up to date.* They represent in general first class hulls, and should be sold as such to buyers who will install in them the highest grade of modern propelling power. The internal-combustion engine is so rapidly developing," continued Mr. Farrell, "that it appears to be destined eventually to replace, in general cargo-carriers at least, the steam-driven form of propulsion. The American merchant marine is far behind in this regard, largely because the present high cost of building internal-combustion engines almost surmounts their economies of operation. With increased production, however, building costs will be reduced, and *the sale of the Board's defective ships for such installations will produce the demand which will lower costs and to this extent America will keep apace with advances in marine engineering.*

"Although a considerable number of coastwise passenger ships have been contracted for, our American shipyards have suffered a serious setback on account of the initiative taken by the United States in the matter of a reduced Naval program. Our yards should receive every possible encouragement to keep them active and up to date. The installation of internal-combustion engines in a large number of merchant hulls," said Mr. Farrell, "would prove a stimulus to our shipbuilders compensating them in some measure for the losses occasioned by diminished Naval construction." Coming from the mouth of such a practical, experienced and far-sighted business man as Mr. Farrell, these recommendations should be given the deepest consideration by the Board for immediate action. Mr. Farrell's words are backed up by his actions. His company has just launched one Diesel-driven motorship and is building another.

posed to convert a large fleet of these steamers, we consider there is urgent necessity for the Board to convert a minimum of half-a-dozen as models. One vessel should be an example of a completely electrical ship utilizing electricity from stem to stern for driving the propellers, operating the winches, steering-gear, pumps, compressors, ventilators, fans, siren, and boat davits, as well as for heating, lighting, cooking and signaling. Another ship should be equipped with direct-connected four-cycle engines; a third with direct-connected two-cycle engines; one should have double-acting Diesel engines, and a fifth should have opposed-piston oil-engines, while the remaining ship should be fitted with oil-engines and reduction-gears. In this manner the Board will have completed installations of all the representative types of power plants, in addition to having a mass of valuable data which should be made available to all shipowners considering the purchase of steamer hulls from the Board for the purpose of conversion.

As it stands at present the Shipping Board, which is trustee for the nation for this useless fleet of idle steamers and which was responsible for their construction, is endeavoring to "pass the buck" to private shipowners to finance the conversion to motorships. It is logical that with the absence of a definite Federal policy and under the present conditions of trade few shipowners can afford to risk their money for conversions six months ahead, and then when the vessel is ready face the possibility of having no use for it, due to unforeseen conditions having arisen. But, if the Shipping Board were in a position to offer to shipowners a fleet of about 50 motorships in 100 A1 condition at between $40. and $50. per ton, they would find a surprisingly active market.

However, the "influence" seems to be prevailing to the extent of preventing the Board adopting any such policy. At the first conversion conference at Washington it was suggested that the Board should give an impetus to the movement by ordering a number of conversions, thus placing builders in a position to prepare their plans and drawings and offer the ultimate standardized product to the shipowner. In response to this Admiral Benson stated that it was all very true and it would be a good thing and he would like to see it done. He believed the Board was authorized to do it by law, but did not believe the Board would consider it for the minute as it is not their desire or intention. *Verb. sap.!*

CABLE SHIP ORDERS

LATELY a number of orders for motorships, motor-yachts and marine and stationary oil-engines have found their way abroad. To the minds of many the situation of Public Service corporations differs somewhat from the case of steamship companies which find themselves faced with the problem of having to compete directly with the vessels of foreign owners, built and operated under much lower wage and material conditions, making the first cost a very important factor. Our telegraph and cable companies have no foreign competition of a nature that raises or reduces their rates for service, and at least seventy-five per cent of their income is derived directly from the American people. Our ship and engine builders alone spend large sums annually with them. Yet after these builders had spent thousands of dollars working up estimates for the construction of two different cable-ships with Diesel-electric drive and steam as an alternative, they are handed out the "pleasing" news that the order for the 2,200 tons vessel has been placed with a French shipbuilding firm, and two 600 h.p. oil-wasting, uneconomical steam engines are to be installed. Perhaps the Western Union directors figured that domestic shipyards have so many orders on hand (sic) that they do not need the work! It is true that by placing the order abroad the Western Union saves a considerable amount of money, but do their stockholders approve such a course? Thinking people understand that private shipowners place orders abroad in order to gain a few points in the strenuous international competition for freight. Repairs on Western Union cables, however, are not governed by the prices set by the natural law of supply and demand.

HORSEPOWER IN SMALL DOSES

RATING an engine to fractions of a horsepower is a strange hobby of some foreign builders. We read for instance of "three 4-cylinder engines of 45.6 b.h.p." They must be mighty sure of the accuracy of their testing rig and injection system if they are ready to guarantee that last one-tenth of a horse-power for constant operation. Again, we notice references to a "twin-cylinder 36.6 h.p." engine and to a "four-cylinder 38.6 h.p." engine. Perhaps the 0.6 h.p. is a little goat-gland extract they put into their engines!

SUBMARINE CONSTRUCTION AND AMERICA'S INACTION

CONGRESS has declined to appropriate the money necessary for continuing the development and improvement of our submarines. And this despite the well-known fact that our own submersibles in commission are way astern of those of other leading navies in size, power, armament and radius —four vital factors in naval warfare. Our most powerful submarines are the three V-class boats just about completing. These, it will be recalled, are of 2,025 tons displacement, 300′ length and 21 knots speed, with twin direct-connected 2,500 b.h.p. Busch-Sulzer Diesel engines driving generators. While it is true that these boats represent formidable weapons, they are by no means as powerful as the latest submarines of the Japanese and British navies. What is equally important—they are too few in number. We should have at least fifty boats of this size, as well as a small fleet of larger and more powerful underseas craft. Particularly are such war-vessels needed for our defense in the Pacific. And if we had on the Atlantic Coast the protection of a big fleet of large-radius, ocean-going submarines, no European nation would care to make war on us or on our shipping. This would be in the best interests of maintaining a policy of peace, and far more effective than cutting down naval estimates.

Great Britain has a fleet of 10,000 h.p. steam-propelled submarines which are not ideal, so is now developing large high-powered Diesel-driven ocean-going submarines such as the big submersible building at the Chatham dockyard. Provision has been made in the current British naval estimates to build another submarine which it is claimed will be far in advance of anything of the kind now afloat. This ship will have a submerged displacement of 3,800 tons, 2,780 tons surface displacement, and will be built by Vickers of Barrow-in-Furness. The cost, exclusive of guns and stores, will be £819,129 ($3,808,950 at the current exchange rate of $4.65 to the £1). France recently appropriated a large sum for the construction of new sea-going submarines and has placed a number of contracts, while her Minister of Marine recently announced the intention of placing additional orders in the near future. Even Holland proposes to spend $160,000,000 on her navy, principally for submarines to protect her possessions in the Far East. America's submarine fleet should be second to none, particularly in view of the two tremendous coastlines and Insular Possessions to be defended, combined with the lack of adequate overseas naval bases.

On April 5th, the First Lord of the British Admiralty made a statement on the submarine question before British Parliament which does not really indicate the true state of affairs. He said that the United States has 76 submarines in commission and 26 in reserve, while Great Britain has 52 in com-

mission and 7 capable of being placed in service, Japan and Italy each has 43 in service without any in reserve. We will not dispute the figures, but we do point out that many of the American boats are small, low-powered, and comparatively inefficient, antiquated craft which would be of very little use in a modern naval battle. The First Lord of the Admiralty also said that no official information was available regarding the number of ocean-going submarines of 1,500 tons displacement, 20 knots speed and of over 5,000 miles cruising radius completed, under construction, or projected by Great Britain, France and Japan; but that the United States had three under construction, and six projected for which no money had been authorized.

One of the most urgent questions for Congress to take up when it meets in December next is that of our Merchant Marine. Requiring nearly as immediate attention and action is the problem of the Navy. When the subject comes up for consideration a large sum should unquestionably be appropriated and authorized for the construction of submarines second to none building elsewhere.

THE WORLD'S SHIPPING SITUATION

IN a recently issued analysis of the world's current shipping conditions the Guaranty Trust Company of New York points out the great importance of America retaining its just share of the world's overseas carrying trade, and expresses the belief that a shipping recovery may be expected resulting in the disappearance of surplus tonnage with the economical comeback. This will make profits possible in the shipping industry comparable to those in internal enterprises. That Congress did not adopt the subsidy means that private domestic shipping interests must be adjusted to continuance for a definite period of highly competitive operation without direct government aid, so far as international trade is concerned. The Guaranty Trust report points out that the average wage scale on an American ship is about $3,000 per month, compared with $2,400 on a British vessel, and that as wages are about one-fifth of the total operating costs, the disadvantage to American shipowners amounts to about four percent.

Dealing with the survey of government-owned vessels now in progress the Guaranty Trust Company states it is probable that 2,500,000 gross tons should be scrapped, which would tend to stabilize ocean freights and remove part of the cloud which hangs over the situation. Stress is laid on the importance of the increase of the world's tonnage of motorships which was 37 percent during the year ending June 30, 1922, compared with an increase in steam tonnage of about 4 percent. Keen competition is causing the increased adoption of the Diesel-engined vessel with its economies in operation, but until the volume of the world's trade increases there is little prospect of profitable utilization of a very large percentage of our shipbuilding capacity.—says this Bank.

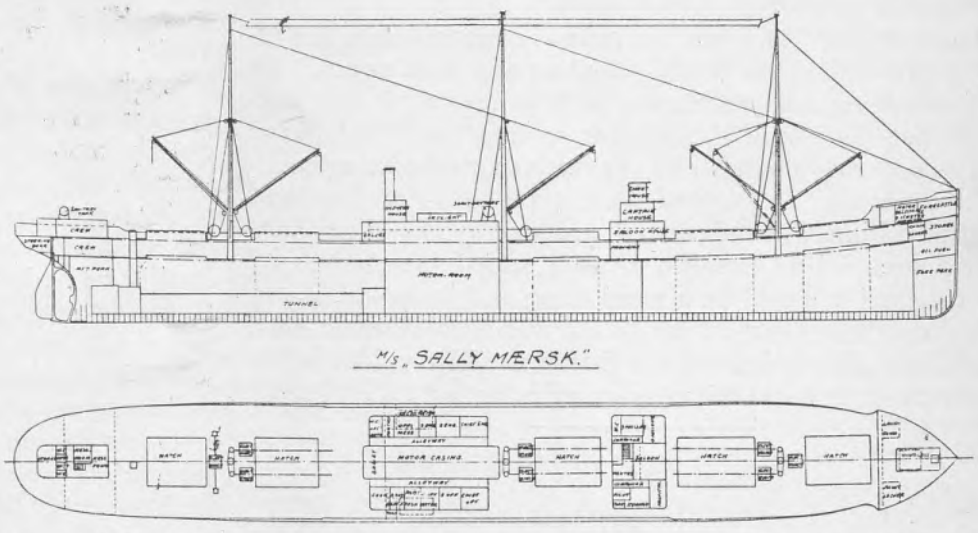
TRIALS OF DANISH MOTORSHIP "SALLY MAERSK"

Among the motorships recently constructed at the Odense Shipyard, Denmark, and to which we have lately referred, is the single-screw Diesel-driven freighter SALLY MAERSK. This vessel is built to British Lloyds 100 + A1 for order of The Steamship Company of 1912, and her machinery was constructed by Burmeister & Wain of Copenhagen. On the trials the mean draft was 9′ 2½″ and an average speed of 10.6 knots was maintained on a displacement of 2,800 tons with the engines averaging 1,685 i.h.p. at 98 r.p.m. Her main dimensions are as follows:

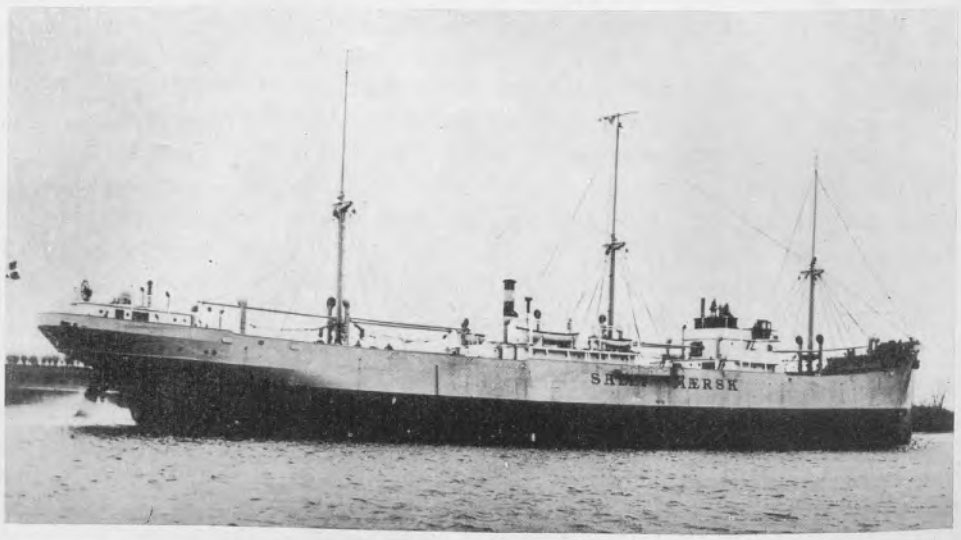
Type of ship	closed shelterdeck
Length (M.D.)	331′4″
Depth (M.D. to shelterdeck)	28′11″
Depth (M.D. to upperdeck)	21′11″
Breadth (M.D.)	44′0″
Displacement, loaded	abt. 7,260 tons
Deadweight capacity	5,200 tons
Register (gross tonnage)	3,252 tons
Capacity of holds (grain)	271,000 cb. ft.
Capacity of holds (bales)	243,550 cb. ft.
Total capacity of fuel oil	687.25 tons
Water ballast in peak tank	110.50 tons
Fresh water	25 tons
Average speed at sea	10 knots
Consumption of fuel oil per day	4.9 tons

The main Diesel engine is of the B. & W. six-cylinder, four-cycle crosshead long-stroke type, having a rated output of 1,600 i.h.p. at 90 r.p.m., the cylinder bore being 630 mm. (24.80″) bore by 1,300 mm. (51.18″) stroke. The compressor for injection of fuel is arranged at the forward end of the crankshaft.

All auxiliary machinery in the engine-room, as well as on deck, is electrically driven, the necessary current being furnished by three 35 k.w. Diesel-electric generating sets. While either one of the generators is of sufficient capacity for supplying current during normal working conditions at sea it is necessary to start two or all three generators when maneuvering in harbor or when loading and unloading cargo. For heating purposes there is a small cross-tube donkey-boiler of 63 sq. ft. heating surface and 50 pounds pressure. It is oil-fired.



Longitudinal elevation and plan of single-screw motorship "Sally Maersk," showing small amount of space required by engine-room and large cargo capacity for a vessel of her tonnage



New single-screw motorship "Sally Maersk," built at the Odense Shipyard and propelled by Burmeister & Wain Diesel engines, which recently visited New York

Problems of the Human Element on Motorships

By A. B. NEWELL

HUMAN element in connection with the operation of marine oil-engines is well worthy of thought, now that American motorships and motor-engineers are becoming more and more numerous. Characteristic of the motor-engineer is his enthusiasm for 100 per cent motor installations. He operates steam machinery not because he likes to, but because he has to.

A man who is compelled to do a thing which he does not like, seldom does it well; consequently the machinery of a motor-vessel with steam auxiliaries may receive less painstaking attention than would be the case on a vessel with oil-engines throughout. A broken morale often causes the entire engine-room equipment to suffer in sympathy with several pieces of inherently troublesome machinery.

A chain is no stronger than its weakest link; likewise a ship is no better than its poor equipment or non-enthusiastic personnel. If steam auxiliaries give trouble in the hands of motor engineers, certain persons may unknowingly—or knowingly, as the case may be—condemn the entire installation. Not uncommonly on vessels with a combination installation the motors are blamed for delay and expense which should be attached to the steam end of the job.

From the ship-owner's point of view the engineer should give value received for the wages paid him. Whether or not he does is a matter which I do not care to discuss. However, I agree with the owner that the engineer should take proper care of the machinery in his charge, regardless of its type or make. But human nature cannot be changed, and I can also appreciate the engineer's attitude with regard to steam auxiliaries, which at their best are more troublesome than oil-engines and electric-motors. Regardless of mechanical and efficiency differences in favor of the latter, the supposedly conservative motorship owner, who insists on having steam equipment, for steam equipment's sake, will find himself confronted with the problem of personal prejudices of a discordant nature which will bring about the same net result, i. e., more repairs, greater fuel-consumption, less cargo-capacity, greater labor-turnover and a larger payroll.

When the steam-engineer takes up oil-engine operation he rapidly becomes a motorship enthusiast. He is disappointed to find steam on a ship with motors, for he almost invariably declares that a small steam-plant is more troublesome than a large one, and requires almost as much work to keep it in order. Steam to him is humdrum routine, of an uninteresting nature, something which he had hoped to relegate to the past.

Without a doubt the human element will play an important part in the operation of our motor-vessels of today and tomorrow. In connection with the engine-room personnel it is all important. For this reason, wherever possible the prospective motorship owner should have embodied in his original plan of construction, as well as operation, a provision for this one important feature.

Problem of the Motorship Engineer in Gt. Britain

Commonsense Interpretation Required of the Regulations of the Board of Trade

THE Marine Department of the Board of Trade is naturally anxious to encourage sea-going engineers to take up their certificates for operating oil motorships, because if this is not done extensively the success of the internal-combustion engine, which is being adopted in increasingly large numbers of ships, will be handicapped. Difficulties have arisen owing primarily to local examiners at the ports taking somewhat different views as to the relation between brake horse-power, indicated horse-power and nominal horse-power. Engineers must be in charge of propelling engines of a given minimum horse-power before they are allowed to sit for examination for their chief's certificate.

Again, the practice with oil-engines is to drive the auxiliaries separately from the main engine. Thus, although the power for the propelling of the ship may be the same in both cases, the steam engine is rated higher by reason of the power provided for driving the auxiliaries than is the case with the oil-engine, because the auxiliaries in the latter case are entirely separate.

Sir Alexander Richardson, M. P. for Gravesend, raised the question with the President of the Board of Trade on behalf of several engineers, and Sir Philip Lloyd-Greame arranged for a meeting between Sir Alexander and the technical officers responsible. Before rejecting any application from the sea-going engineer to sit for his "first" certificate, the examiners at the ports will in future take into sympathetic consideration all the facts so as to render equal treatment to the steam engine and the internal-combustion engine. It is hoped that, as a consequence, there will be a considerable accession to the number of engineers, especially with oil-engine experience, sitting for first-class certificates for Diesel-engined ships.

The Diesel-Engine Operator Question*

By JOHN STIGAN

Standard Oil Co. of California

WITH regard to the engineers for our Diesel-engined vessels, we have had considerable success with taking our steam engineers and placing them as machinists in the shops where the engines are built, in which capacity any wide-awake man has ample opportunity to make himself thoroughly familiar with both the detailed construction and working principle of the engines. Then as the engines are completed and installed, the men are selected for their positions and appointed to follow up the work of installation. This plan has met with much success and co-operation, both among the men and the engine builders, the latter always being anxious to employ the men so recommended by the company. It is believed that through a general adoption of this plan, which will appeal to most men who are willing to make a temporary sacrifice both in rank and remuneration in order to qualify themselves for responsible positions in a growing field, a supply of Diesel engineers of the very best kind will be created.

* From Pacific Marine Review.

SERVICE OF MOTORSHIP "LASSELL"

Quite regularly between New York and South America plies the British motorship LASSELL of the Lamport & Holt Line. She is a sistership of the Diesel-driven vessels LINNELL and LEIGHTON engaged in the same trade, and was built by McMillan of Dumbarton, Scotland, in 1922. She is a twin-screw ship of 447′ long, 56′ breadth, 37′ 6″ depth molded and 28′ 6″ mean loaded draft, and is of 10,494 tons deadweight capacity. Her propelling machinery consists of two four-cycle, six-cylinder, single-acting, direct-reversible Harland & Wolff B. & W. type Diesel-engines of 2,000 shaft h.p. each, which give her a speed of 10.7 knots at 118 r.p.m.

The LASSELL has been operating with the utmost regularity on a fuel-consumption per day at full speed of 11.6 tons per day for all purposes, with a port consumption of only ½ ton. Fuel of 28.1 deg. Beaumé is used and 14.5 gallons of lubricating-oil per day are consumed. She has three 150 h.p. auxiliary generators furnishing current for all deck and engine-room auxiliaries. Maneuvering air-compressors, as well as all pumps, are of Harland & Wolff's standard type and are installed in duplicate.

Of especial interest are the electric cargo-winches, these being of the MacFarlane multi-barrel type electrically driven through worm-gear, the motor being installed with two drums on each side, these drums being thrown in or out of use by means of a clutch. This arrangement allows the motor to run constantly in one direction, both for hoisting and lowering, thus doing away with the heavy peak loads so common with reversible motor driven winches. On the whole she is a splendid type of cargo-carrier, a model of the ship-builder's and engineer's skill and well worthy of study on the part of American shipowners and engineers.

CURRENT REVIEWS

Oil Power, by Sydney H. North. Published by Sir Isaac Pitman, London, 1922. $1.00. We have read this little volume in the publisher's Common Commodities and Industries series and can recommend it to those desiring to obtain at a glance a general knowledge of oil power for both marine and stationary use. The author is well known as editor of *Oil Engineering and Finance* and the *Petroleum Year Book* and has written in a concise manner of the advantages of oil power describing various methods of use. We were particularly interested in the two chapters on Diesel and other oil-engines, and on motorships, which describe various types of such engines and enumerate the advantages of the motorship over steamers. Due to a typographical error on page 82 the fuel-consumption of a motorship is erroneously given as 1.02 lbs., whereas it should read 0.30 lb. per i.h.p. hour.

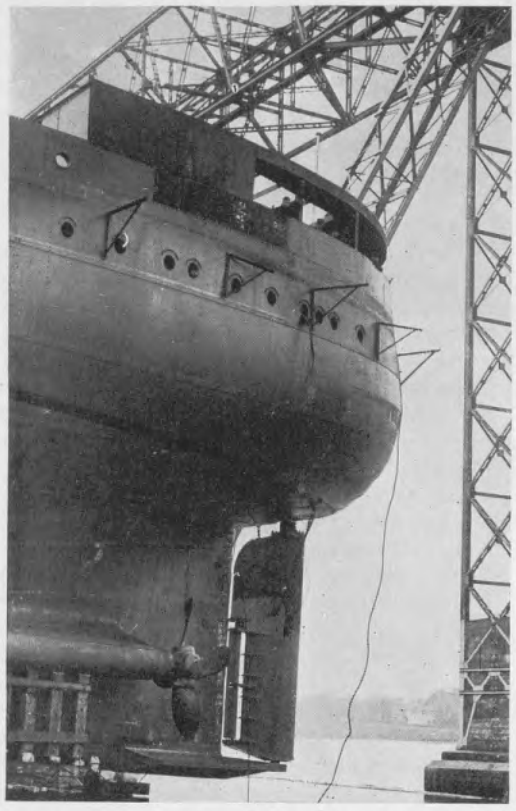
Motorship "Odenwald" and Her Novel Rudder

Further Particulars Regarding the Flettner Design of Rudder Installed on a 9,000 Tons Hamburg-Amerika Line Motorship

IN our issue of August, 1922, a preliminary description was given of the Flettner design of rudder which was then being installed on the cargo motorship ODENWALD, built by the Deutsche Werft of Hamburg for the Hamburg-Amerika Line. This vessel is now in service, and on the 30 hours' trial it was found that the rudder gear worked very satisfactorily when the vessel was steered by the helmsman. The vessel started on the maiden voyage of her regular service without any trouble or delay to the gear except for the time necessary to install ball bearings to reduce friction in the axiometer system.

The ODENWALD is of 9,000 tons d.w. and not 8,000, as stated last August, and has the following dimensions:

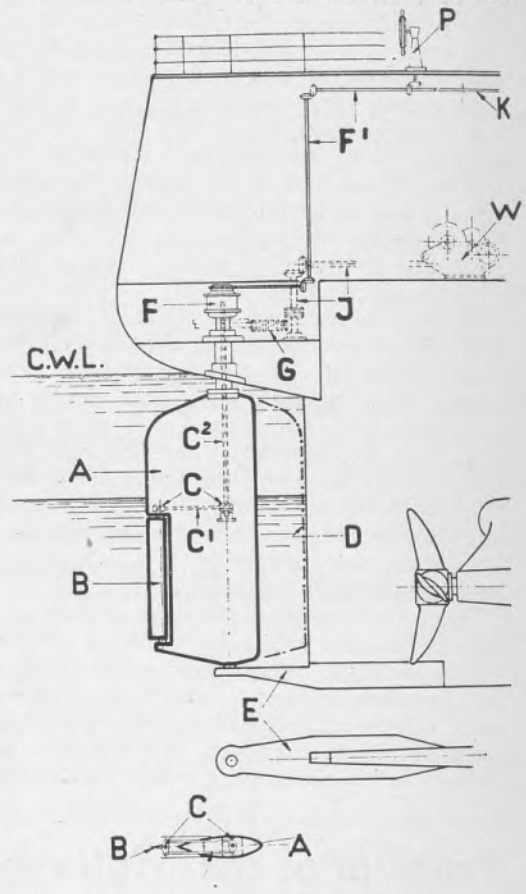
Deadweight Capacity	9,000 tons
Gross Register	5,000 tons
Power	3,100 i.h.p.
Length	398′ 3⅝″
Breadth	53′ 11⅝″
Depth (moulded)	38′ 3⅝″
Speed	11 knots



Stern of the motorship "Odenwald," showing the novel rudder in astern position

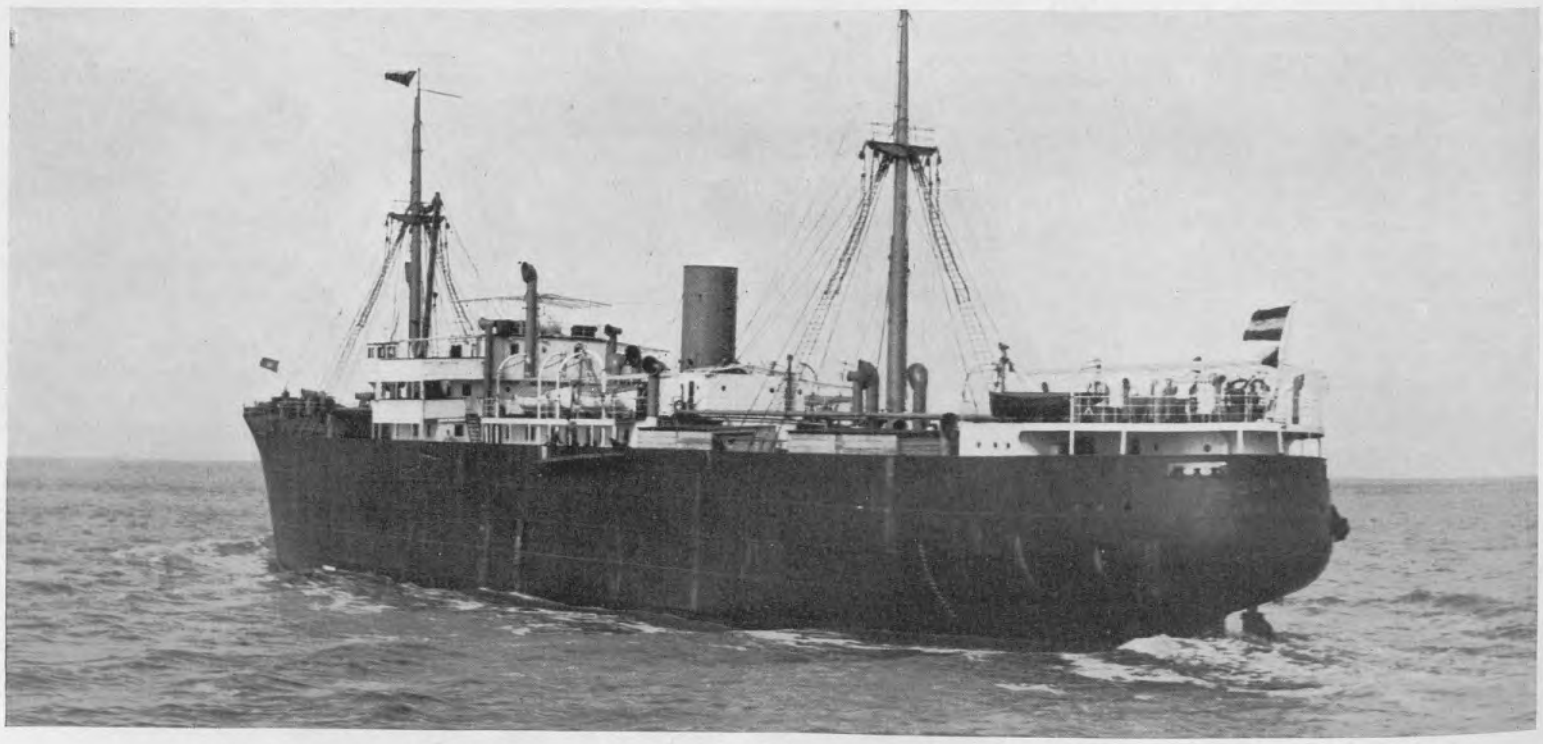
The principal work of this rudder is to eliminate the power steering engine, which is accomplished by utilizing the turning effort of a small auxiliary rudder, or deflector, incorporated in the after part of the rudder, as illustrated by the views given, to move the main rudder. As we already have described this rudder, it is not necessary to go into full details. Briefly it may be said that the motion of the auxiliary rudder is controlled by means of a mechanical gear consisting of a pair of yokes with horizontal rods running vertically from the hollow axis to the head of the main rudder post. The rudder of the ODENWALD has about 130 sq. ft. surface, with about 12 sq. ft. surface for the auxiliary rudder. Both are slightly balanced and are fish-shaped in their horizontal sections. It should be noted that the turning gear of the auxiliary rudder is independent of the motion of the main rudder, the latter being able to move completely around, which always occurs when the ship moves astern. Then the rudder automatically turns at 180 degrees and acts as a bow rudder. The steering principle remains as before, acting very promptly under the influence of propeller suction, because the main rudder is already turning under the influence of the astern rotating propellers before motion of the vessel herself has commenced the astern direction.

In conjunction with the rudder installation another device has been incorporated, namely, the gyroscope compass developed by Dr. Anschutz, by which, as with the Sperry mechanical helmsman, the ship automatically follows the course set by the officer on watch and continually corrected by the gyroscopic electric helmsman. At sea steering is said to be more exact than when in the hands of a human element.

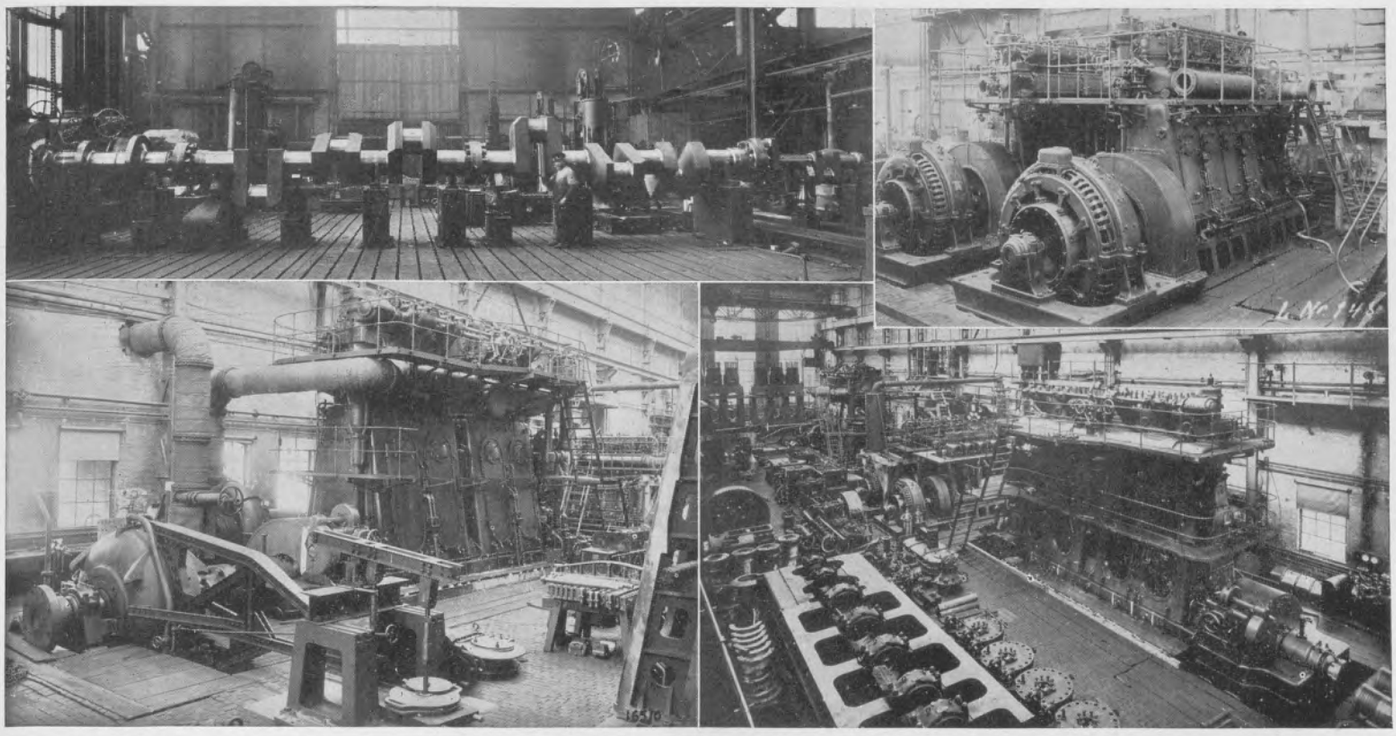


A—Main rudder.
B—Flettner deflector.
C—Yoke.
C¹—Parallel rods.
C²—Deflector shaft.
D—Position of main rudder astern.
E—Skeg.
F—Gearbox.
G—Spare tiller.
J—Shafting for spare tiller.
K—Shafting for steering wheel on the bridge.
P—Flettner steering wheel on the poop.
W—Electric winch as spare steering engine.

The Flettner rudder



Hamburg-Amerika Line's new motorship "Odenwald," which went to South America on her maiden voyage



Sulzer Diesel Engine Construction at Ludwigshafen, Germany. Upper left-hand: Crankshaft of a 6-cylinder, 3,000 shaft h.p. at 100 r.p.m marine engine. Upper right-hand: A pair of 400 b.h.p. at 200 r.p.m. auxiliary Diesel engines for ship's engine-room auxiliary purposes. Lower left-hand: Four-cylinder, 2,000 shaft h.p. at 100 r.p.m. mar.ne engine. Lower right-hand: Erecting shop showing six Diesel engines under construction

Sulzer Engine Construction in Germany

Marine Sets of 2,000 b.h.p. and 3,000 b.h.p. per Shaft

EXTENSIVE orders have been placed for Sulzer Diesel engines during the last twelve months, including passenger liners up to 13,000 shaft h.p. in twin screw. Consequently it has been necessary to build these engines at other plants than the Winterthur works of Sulzer Bros. in Switzerland, and many of these engines are now being constructed in England by licensees.

During recent months four large Sulzer two-cycle Diesel marine engines have been built at the Sulzer's plant at Ludwigshafen, Germany, and we are able to publish some illustrations showing the work in progress. Two of the four-cylinder engines just constructed are being installed at the Howaldtswerke, Kiel, in the 14,000 tons d.w. tanker referred to previously as being constructed for the German-American Petroleum Company, which is affiliated with the Standard Oil Co. of N. J. This vessel will have a length of 502′ 7″ overall by 57′ 6″ breadth and 39′ 5″ depth, and a loaded speed of 11 knots. In service the engine speed will be maintained at 85 r.p.m. in order to secure the best efficiency from the propeller. Under normal conditions the output of this engine is 500 shaft h.p. per cylinder at 100 r.p.m.

As previously published in this magazine, two six-cylinder Sulzer Diesel engines of the same cylinder output, namely 3,000 shaft h.p. per engine are being constructed for the North German Lloyd passenger vessel building at the Weser Shipyard, in Bremen. This vessel is 460′ 2″ long overall, by 57′ 6″ breadth by 42′ 9″ depth, and will have a sea speed of 13 knots. These particular Diesel engines were originally destined for another motor-liner, the order for which was cancelled when the German merchant fleet and reconstruction program was cut down. The North German Lloyd purchased these engines when they were partly built and sent them to the Weser yard to engine this liner, which was originally planned to be steam propelled.

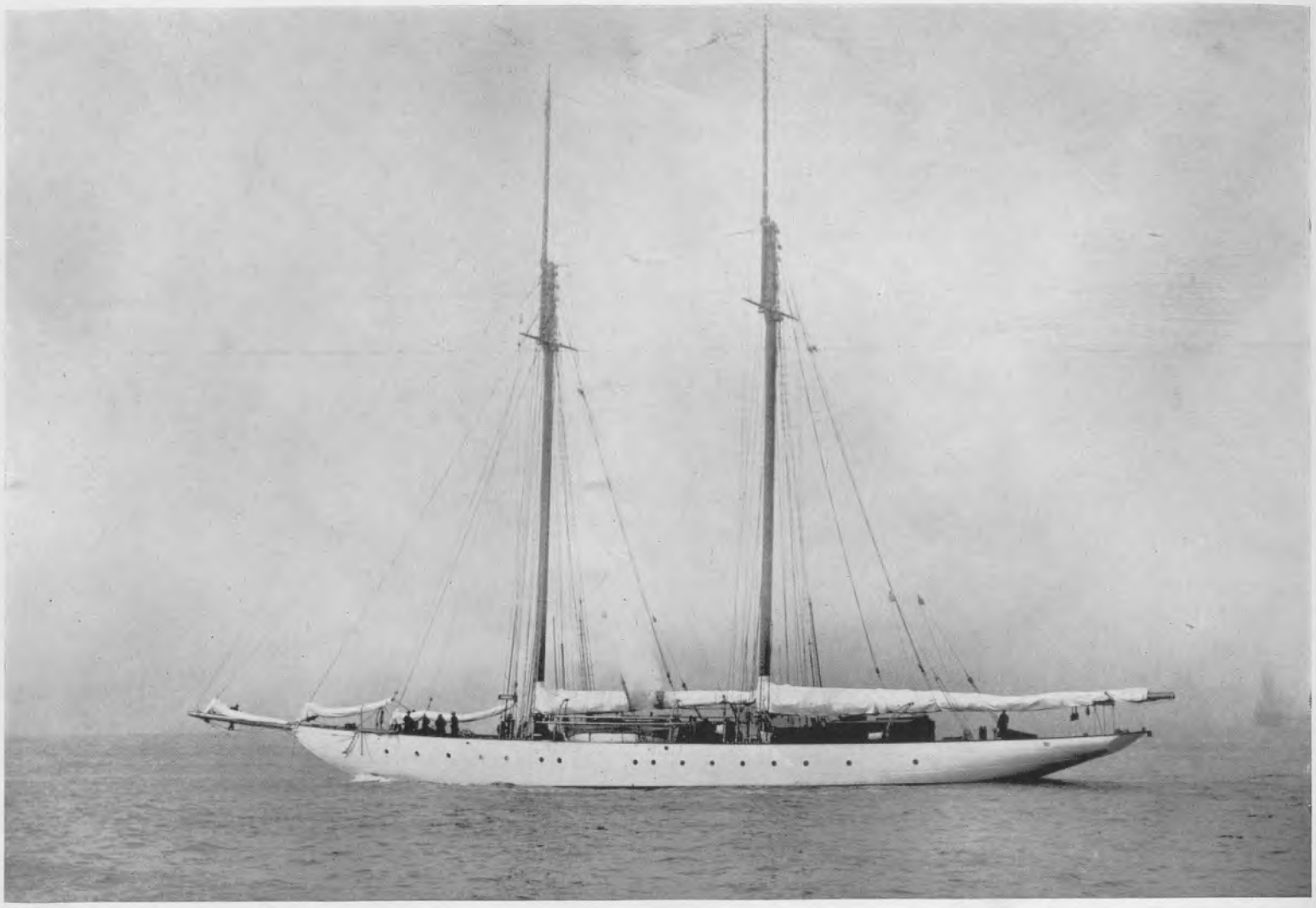
As with the tanker engines, the 3,000 h.p. sets will turn at 85 r.p.m. The cylinders have a diameter of 680 mm. (26.77″) and 1,200 mm. (47.24″) stroke. Scavenge air for the cylinders is furnished by an electrically-driven turbo-blower, which can be seen in the lower left-hand illustration between the water brake and the engine, alongside the flywheel casing. The use of this turbo-blower instead of reciprocating pumps driven off the crankshaft at one end of the engine, saves considerable space, although some two-cycle engine builders economize space by operating the scavenging pumps by rocking-levers off the crossheads.

We understand that these engines have been arranged to burn tar-oil when necessary, without the use of a lighter mineral oil as special ignition-fuel, the cylinders being heated up first by running for a short time on Diesel-oil. Under conditions prevailing at the present time the use of tar-oil fuel is out of the question on routes favored by large motorships, unless they are making German ports their base. But the possibility of using this fuel may prove to be of great importance for economical running of engines should there be any radical change in the mineral-oil market. As it is, the possibilities of using low grade mineral fuel-oils is of more importance than using tar oil.

For auxiliary purposes on the passenger-liner there will be two Sulzer Diesel engines of 410 brake h.p., each coupled to electric generators, a pair of which are shown in one of the illustrations. The electrical power will be used for the cargo-winches and other purposes on board ship, while on the tanker the loading and discharging pumps will be operated by steam from an oil-fired donkey-boiler.

PROFITS FROM DIESEL-ENGINE BUILDING

A reserve fund exceeding the capital of the company and a contingency fund of two-thirds that amount show the strength of Burmeister & Wain's financial position. This now world-famous Danish concern celebrated last year the fiftieth anniversary of its foundation. When formed in 1872 it had a capital of 4,000,000 kroner (about $1,000,000), increased later to 6,000,000 kr. and then reduced to 5,000,000 kr., at which figure it stood from 1879 till 1906. In the latter year the capital was doubled, and it still stands at 10,000,000 kr. (about $2,500,000). There was no increase during the war, but a meeting has now been called to consider the issue of 5,000,000 kr. of stock, which will be offered to the present shareholders at par. This is as near the declaration of a stock dividend as a conservative European company will go. Be it noted that Burmeister & Wain stock is quoted in Copenhagen at about 140, and dividends have been averaging about 15 per cent per annum. The prosperity of this company to-day is due to the success it has made of its Diesel-engine work, which has secured it many orders for motorships and enabled it to sell building licenses that produce considerable revenue. The firm was not always so prosperous, having seen hard days during its fifty years of life. Indeed at the time its first motorship SELANDIA was built, it could scarcely have weathered a failure. But there was no failure! They got on their feet, and they have made a success of it ever since.



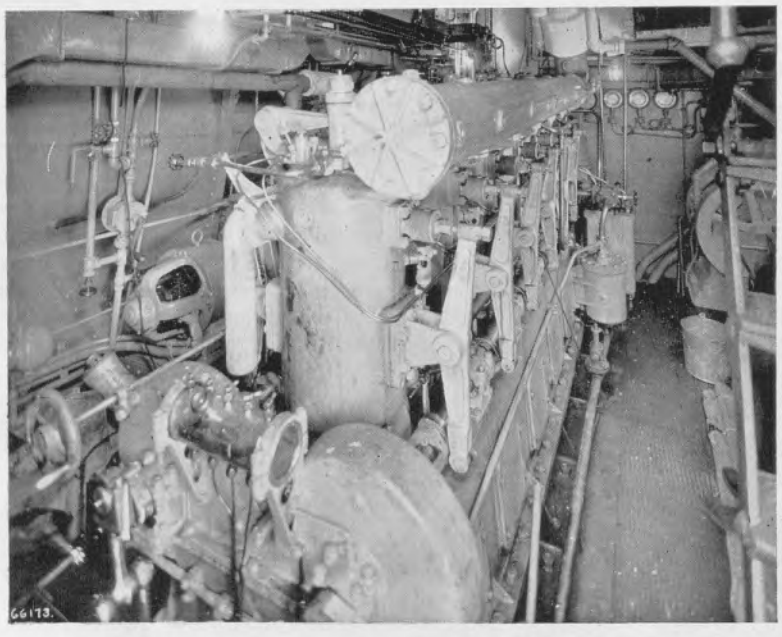
Keith Spalding's Nelseco-Diesel powered auxiliary yacht "Goodwill"

Diesel Auxiliary Yacht "Goodwill" on Long Cruise

Keith Spalding's New Nelseco-Powered Schooner Proves Splendid Means of Recreation

OCEAN cruising, exploring picturesque and romantic islands "off the beaten track" of the sea, deep sea fishing and sailing—these have ever appealed to red-blooded sportsmen of all ages. When a man has both the leisure and the means to enjoy such pleasure the natural course is to purchase a vessel and set sail. Many men of means have of late turned to the sea for recreation in this way, among them Keith Spalding, member of the New York Yacht Club, whose home is in Los Angeles, Calif. His auxiliary yacht GOODWILL made her maiden cruise in the West Indies before proceeding through the Panama Canal to her home port.

This two-masted auxiliary steel schooner was constructed from designs by Henry J. Gielow of New York by the Harlan plant of the Bethlehem Shipbuilding Corp., and she is 161′ length overall, 120′ length on water line, 30′ breadth, 21′ depth and 15′3″ draft. As will be noted from the illustrations, she is a handsome yacht of wholesome type, model and finish, without radical features. The order for her design was placed with Mr. Gielow largely because of the successful service of the 156′ mag-



M. Y. "Goodwill"; the engine-room

M. Y. "Goodwill"; the owner's cabin

M. Y. "Goodwill"; owner's deck observation room

M. Y. "Goodwill"; the dining saloon

netic survey yacht CARNEGIE, designed by him, which has sailed in deep sea voyages over 300,000 miles since she was built in 1908.

The GOODWILL is constructed of steel to Lloyd's highest rating, the decks and all the skylights, companionways, deck houses, etc. are of teak, the latter having steel frames. The forward deck house, 20′ by 10′, contains the captain's room and wireless room; the after house, 15′ by 12′4″, forms a lounging and observation room. Both houses are fitted with 15″ Smithson ports. Leading down from the after deck house is a stairway to a lobby from which access is had to the owner's and guests' quarters which occupy 50 ft. of the length of the vessel aft of the lobby. They consist of five staterooms, four bath rooms, trunk room, linen closets, etc. Forward of the lobby is a teak finished main saloon 19 ft. long.

The machinery space is amidships between steel bulkheads. Here is installed a six-cylinder four-cycle Nelseco Diesel engine of 180 h.p. which drives the GOODWILL at 7½ knots. We recently endeavored to obtain a record of the fuel-consumption and details of operation on the maiden voyage, but found that the yacht was cruising along in perfectly satisfactory manner, owner and guests were enjoying a wonderful fishing cruise and the consumption of oil was so low that it was not given much more than a passing thought. Under the cabin flooring in steel tanks built in as a part of the yacht's hull is sufficient fuel for a cruise of 3,500 nautical miles at full speed under power.

In addition to the main-engine are two 7½ k.w. Winton generating-sets, Edison storage batteries of double the capacity usually installed in such a yacht, a Clothel ice making and refrigerating plant of large capacity for extended voyages, a Kewanee electric pump for an air pressure system for running water throughout the yacht, and a Thermofan system, made by Schutte & Koerting, which supplies hot air in cold weather, cool air in hot weather and produces efficient ventilation at all times. For handling the anchors there is an American Engineering Co.'s "Providence" pump-brake yacht windlass driven by a 7½ h.p. electric motor below deck, and there is a most complete equipment of small boats. These consist of an owner's launch 25′ by 6′, equipped with a Scripps gasoline engine which drives her 16 miles an hour, a 22′ American Balsa Co. steel life-boat, two launches and two A. B. C. Balsa life rafts. The launches were specially designed by Gielow and built by Henry B. Nevins of City Island, N. Y.

The spars are of Oregon pine with galvanized steel wire standing rigging and running rigging of Manila rope except the halyards, which are steel. The brown Egyptian duck Ratsey & Lapthorn sails add to the beautiful appearance of the GOODWILL, presenting a contrast to her glistening white paint while they drive her at a fast rate.

To go back to the accommodations of this yacht, we find on the starboard side abreast the engine space staterooms for the engineers and stewards and an officers' mess room 10′ long. Opposite on the port side is the galley, pantry, while forward of the mess room and galley are three officers' staterooms and toilet room. Forward is a forecastle for 12 men.

She is admirably planned, constructed and powered for the work she is doing. Her first voyage itinerary includes Bermuda, Cuba, St. Kitts, Guadeloupe, Martinique, St. Lucia, Barbados, St. Vincent, Grenada, Trinidad, the coasts of Venezuela and Colombia, Curacao, through the Panama Canal and up the Central American and Mexican coasts to Los Angeles. Her next cruise will be to the South Sea islands, the objective of many an adventurous yachtsman in recent years. Her performance to date indicates that she can afford a pleasant and comfortable floating home on any voyage.

Fred Olsen & Co.'s Ninth Motorship

New Diesel Vessel "Borgaa" Runs Trials

While American shipowners, shipbuilders, naval architects and marine engineers are going into all the theoretical considerations as to the practicability of installing Diesel-engines, splitting hairs on the probable depreciation, length of life and relative economy of a motorship as against a steamship, European shipowners are *building* and *operating* motorships. In other words, while we are figuring and wondering, and wasting valuable time on problematical considerations already settled abroad, our competitors are taking the business right under our eyes by operating these very ships more economically than we can ever operate our steamers.

One of these progressive shipowners is Fred Olsen & Co. of Christiania, Norway, who are just putting their *ninth* motorship in service, the BORGAA. She has been constructed by Akers Mek. Verkstads of Christiania, the Norwegian licensees of Burmeister & Wain. Fred Olsen & Co. own, with the exception of Wilhelm Wilhelmsen's AMERIKA, all the motorships which have been built by Akers, these being the 1,500 h.p. sister ships BRAZIL and BAYARD and the 2,000 h.p. BORGLAND. In addition to these they own the 11,000 tons 3,100 h.p. motorships GEORGE WASHINGTON and THEODORE ROOSEVELT, built by Burmeister & Wain, Copenhagen, and the two smaller 900 h.p. motorships BALZAC and BATAVIA, built by the Odense Shipyard, Odense, Denmark. All the Olsen ships are powered with Burmeister & Wain Diesel-engines. The BONHEUR, sister ship to the GEORGE WASHINGTON, was sunk by a mine in the North Sea on her maiden voyage during the war.

The latest addition to the Olsen fleet, the BORGAA is of the standard type of cargo ship, and is of the following dimensions:

Deadweight	7,200 tons
Length o.a.	377′0″
Breadth	51′3″
Depth	34′0″
Horsepower (total)	2,800 i.h.p.

Three complete steel decks are provided and there are three masts and ten derricks serving five large hatches. Electric cargo-winches, windlass and steering-gear are part of the equipment, while there is in addition an Akers oil-fired vertical donkey-boiler furnishing steam for heating and driving an emergency air-compressor. Two Akers B. & W. Diesel-engines of 1,400 indicated h.p. as well as three 80 h.p. two-cylinder auxiliary Diesel-engines furnish the power. She will be placed in the Norway-Pacific Coast service.

Positive Measurment of Fuel-Oil on Motorships

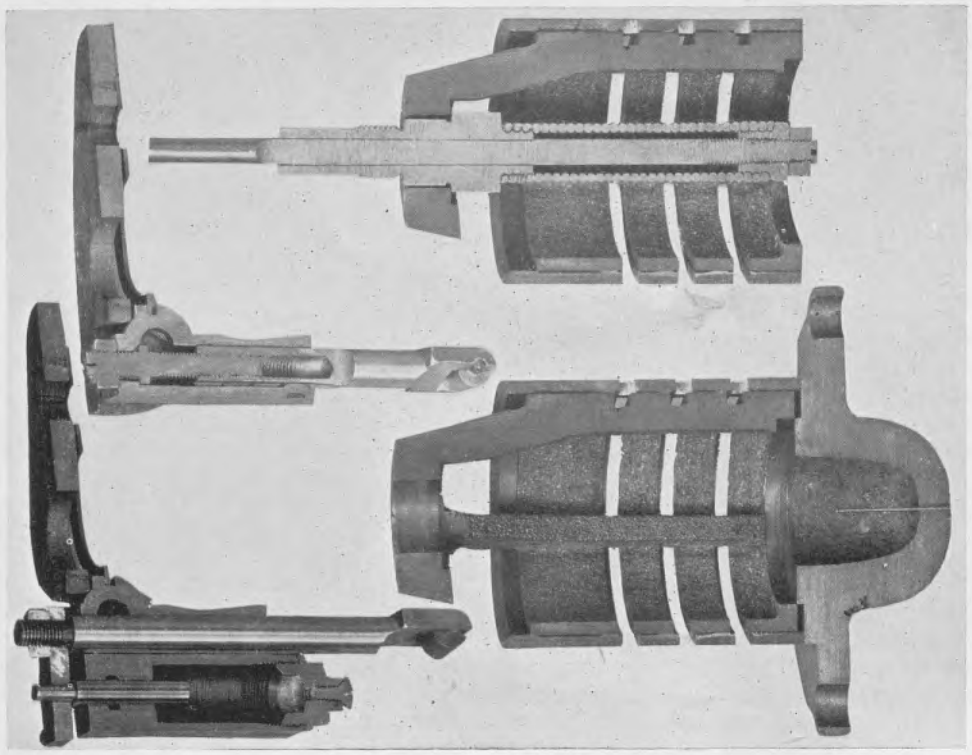
How the Bassler Meter Integrates the Flow Through Oil-lines with Compensation for Temperature

LOG entries of fuel-consumption on motorships are generally made by reading the gauge-glass on the settling tank. The figures are no more accurate than they are generally accepted to be, or in other words they are regarded as sufficiently approximate for daily comparisons.

Every chief engineer knows, and makes some allowance for, the differences in liquid measurement due to temperature variations. He knows also that the number of gallons in a ton of oil varies according to the gravity of the oil. Unless the gauge-glass readings were corrected for these variables, the entries in the log would be very misleading. Yet at best the corrections still leave the figures open to doubt, because an engine-room is not a laboratory and one cannot expect the engineer of the watch to be applying variable correction factors at each individual fuel reading.

Daily fuel consumptions are customarily quoted in tons. Oil companies sell fuel by the barrel. Settling tanks are calibrated in gallons. These different practices have their origin deep-rooted in trade customs and facilities. They cannot be changed. The marine engineer has to put up with them. To complicate the problem still more, the influence of temperature and of fuel gravity has to be taken into account. A ton remains a ton at any temperature, but contains more gallons the higher the temperature and also the lower the gravity. A barrel remains a barrel for any gravity oil and for any temperature, but weighs less the lower the gravity and the higher the temperature. On the other hand the "gallon" marked on the settling tank is a gallon at only one temperature, and gives high or low readings according to temperature changes.

Any piece of mechanism that will automatically reduce the measurements to a standard basis must obviously introduce greater accuracy and simplify the engineer's work. That is what the Bassler meter is designed to accomplish. It is calibrated either in "constant-weight gallons" or in "constant volume gallons," but in both cases is within practical bounds unaffected by rates of flow, line pressures, viscosities, temperatures or other variable factors.



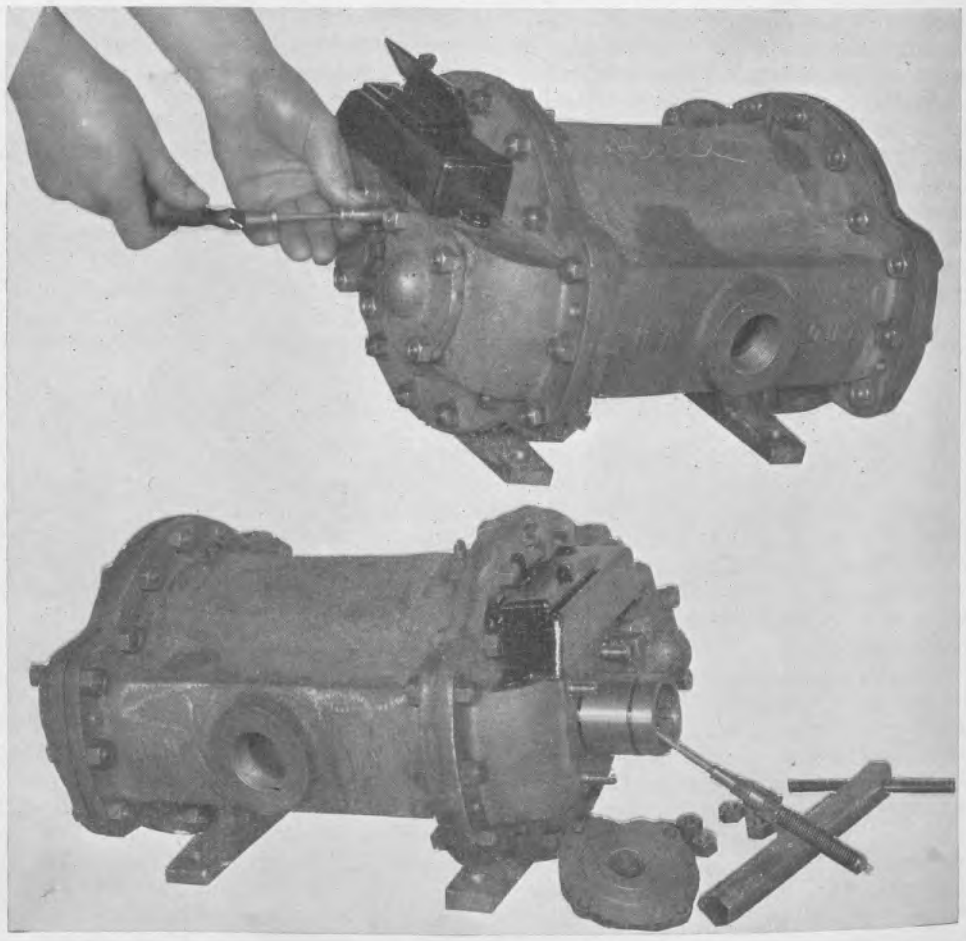
These details of the Bassler meter are: on the left above, section through manual control, and below, section through thermostatic control; on the right above, section through valve and plunger rod, and below, section through valve and dashpot

A Bassler meter will enable the ship to check the amount of oil pumped into the bunkers and will show how fast that fuel is later burned in the engines. It gives direct readings in gallons without any calculations and thus provides an easy method of keeping accurate records.

Fittingly enough, it was conceived by an oil-company employee who was held responsible for bulk storage and retail sales. He took his invention to the American Liquid Meter Co., a concern with headquarters in Portland, Ore., and under the active encouragement of the Farmers, father and son, who direct that business, the inventor was able to develop the device entirely in the West.

At the present time the Bassler meter is in use by the Department of Weights and Measures in Seattle for checking other measuring devices and calibrating tanks. It is being used by the Union, Standard and Shell oil companies in California, has been adopted by the Pacific Mail, Matson Navigation, Columbia Pacific and Puget Sound Navigation companies for their oil-burners, and has found friends in other lines ashore.

Before a description of the instrument is given, a summary of the requirements can well be presented, in order that the suitability of the design may be appreciated. A meter must be accurate at all temperatures and its operation must not be affected by heat or by cold; its accuracy must be preserved on extremely low heads and must not be disturbed at extremely high pressures; its operation must not be interrupted by an accumulation of sediment or foreign matter within the mechanism or body and should



Method of adjustment of manual control is shown in the upper view, and removal of valve cage in the lower picture

the meter cease to function, through some unforeseen cause, yet free passage of oil must be afforded in order to keep the engines going. There must be provision against air-locks, and the measuring device must not cause pulsations in the line; also it is desirable that the meter should take the same line flow as that coming from a duplex pump of the same size. To all of these requirements the Bassler meter responds in a thoroughly sound way.

In construction this device consists fundamentally of a closed cylinder containing the oil, within which there is a concentric barrel, through which the oil is measured by the reciprocating strokes of a double-acting piston. The space between the measuring barrel and the outer body is divided into two chambers, one containing the inlet valves to the measuring barrel and the other housing the delivery valves. Thus the flow through the meter is always in one direction.

Piston valves are used to which plunger rods are attached. The measuring piston, at a certain point in each stroke, makes contact with the plunger rods of the inlet valve and delivery valve at one end of the cylinder and moves them against spring pressure until, at a predetermined point, a trip falls and holds the valves in place. Simultaneously, on the other side of the piston, a trip is released permitting the pair of valves at the opposite end of the cylinder to assume their defined position under their spring action. It will be readily understood that the valve operation requires the inlet valve on one side of the piston to be open when the inlet valve on the other side is closed and the delivery valves to be correspondingly taken care of. There is nothing special or intricate in this.

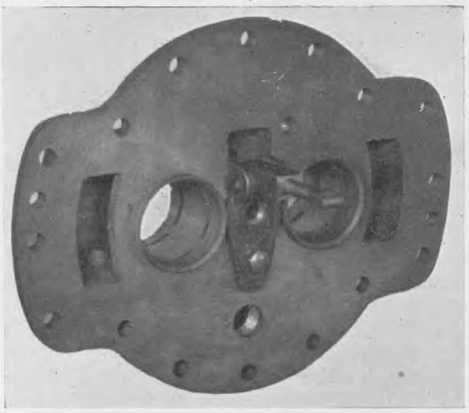
Of importance, and of particular design, are the adjustments, two in number, namely, the thermostatic control and the manual control. The first of these consists of a small metal tube containing a liquid of similar coëfficient of expansion as the liquid that is to be metered. It is permanently fixed at one end with the other end floating and carrying the valve trip bar. Consequently the temperature changes cause the valves at one end of the meter to open proportionately earlier or later, thus having the effect of increasing or reducing the volume measured by the piston on each stroke. In this way the measurement by "weight-gallon" is maintained constant. Manual control is virtually a "factory" adjustment, being made on the valve trip at the other end of the measuring cylinder.

For any definite grade of oil the thermostatic control can be made exact. To take care of the varying grades of oil which a ship may have to purchase as it bunkers at different ports, the engineer should order a series of thermostatic controls to be charged with different liquids at the factory.

As to wear in the instrument, we may point out that all the parts being relatively light and moving in oil the friction is very small. Moreover, the valve motion is dampened by a dash-pot action obtained through the simple provision of a shallow-ring in the valve-cover, and this eliminates impact, with its corollary vibration and wear. Bushings are used in the valve ports, and can easily be replaced when in course of time a slight wear is shown. The piston is fitted with light rings that can easily be replaced. Surplus stock left in the cylinder permits reboring by any first-class machinist when necessary, without affecting other working parts.

Such is the Bassler meter. It affords a wide scope for application. It can be used for measuring cargo, as well as for checking bunker supplies and fuel consumptions, being made in several sizes. In the engine room it can easily serve to segregate the consumption of the main engines from the consumption of the auxiliaries. Indeed, its utility is so wide that anyone having to do with the flow of liquids can use it.

"A complete system of bookkeeping is most essential upon a ship"—writes a chief-engineer. "I have to keep an account of fuel, water, supplies and lubricants. Well and good! The fore deep fuel tank has no sounding pipe. I have to give accurate reports of the fuel on hand. There are no fuel meters. The daily-service tanks have gauge glasses for taking readings, but these are never steady, for the vessel in rolling keeps them constantly on the move."



End cover of meter, illustrating the valve-chest bushings and valve tip

Opinions Invited from Our Readers

Remarks on the Nomenclature of Oil Engines

"Many minds are exercised by the problem of the rational nomenclature to be adopted for the distinctive grouping of oil-engines. The terms in common use today are not free from confusion," states *Oil Engine Power*, our sister magazine, published monthly in the interest of Power Plant economy and for recording international development of the stationary, heavy oil-engine. "Under the names Diesel, surface-ignition, high-compression, low-compression, hot-bulb, etc.," continues the article from which we quote, "a large proportion of existing engines can be classified without discussion, but the others do not fit very accurately under any single heading.

"An article in our March issue on the 'Stationary Oil-Engine Industry in Great Britain,' contained a plan of grouping based upon pressure. It did not accord at all with our ideas, but the article was written by a man who stands high in his profession on the other side of the Atlantic. The fault we find with his system is its lack of definition.

"Naturally, all oil-engines can be sorted into low-pressure, medium-pressure and high-pressure categories, but even if the whole world were to agree upon the actual limits for each class, how much further advanced should we be?

"A Diesel engine and a Brons (Hvid) engine would both fall into the high-pressure class, yet they have characteristics that are wide apart. In a fairly large range of engines that use a cold compression below the 400-pound line, there is a family likeness that would suggest they all go into one class, but the arbitrary nature of the pressure classification system would probably separate them.

"All efforts to devise a plan depending upon one characteristic of the engines seem to have failed. Can the problem actually be solved? Is there ever likely to be sufficient unanimity amongst engine-users and engine-makers? In one power plant a type of engine will be known as a Diesel which the superintendent of another plant will unequivocally state is not a Diesel.

"A similar disagreement is sometimes to be found in the factories. We have in mind right now a style of engine which one manufacturer hates to have known under any other name than a Diesel whilst a competitor with a very similar basic design strongly asserts it is not a Diesel. What to do in such a case? Who is right? And whilst they both follow their own respective ways they conspire to cause confusion in the minds of power-users.

"There is nothing wrong with the generic term 'oil-engine.' How much further do we need to go? One can specify whether the type is two-cycle or four-cycle. It is useful to know whether air is used for the fuel-injection, but whilst the term 'air-injection' is fairly precise, its antonym 'airless-injection' or 'pump-injection' is not nearly so definite, because it groups together, for instance, the old Mietz and Weiss with the Vickers, which are very far from being the same. 'Solid injection' is altogether wrong, because none of the engines we know burn a solid fuel at all.

"Right here we come back to pressure again, but this time in relation to injection pressures. It seems impossible to solve the puzzle. We are well enough content to acknowledge the utility of the term 'surface-ignition,' but we believe the time has about come to discard the term 'Diesel.'

"Ever since Vickers first demonstrated the success of the high-pressure airless-injection in their engines, there has been a gradual trend away from the characteristics of the original Augsburg Diesel engine. It may be convenient for some time to come if the term 'Diesel-type' be used to designate all those engines in which the ignition of the fuel-charge is effected either by the heat of compression alone or with the addition of only a very little extra heat entrapped from the previous combustion but

without the aid of any uncooled surface.

"Gradually, however, we believe the German name will drop out of use, because of changes in engine designs. At the present day there still are engines which belong unquestionably in the Diesel class; there are others which get there on a doubt; many are way off from it.

"Fortunate, indeed, is the manufacturer who does not need to trouble himself with this question. If he hammers away steadily at the propagation of his own name and builds only one type of style of engine, he can educate the buyer to ask for his engine by name. Consistent advertising with the proper appeal is one of the very greatest helps towards the acquisition of a good reputation.

"Quite a handful of engines are now known all over the country by name, and nobody ever stops to consider in which arbitrarily appointed class they belong. These are the engines of some of the older manufacturers, whose merits have been made known from mouth to mouth, a slow but very effective process. Would it not be easier for the whole oil-engine world if all engines were known the same way?"

In the May issue of *Oil Engine Power*, from which the above excerpts are taken, there are many articles dealing with oil-engine operation and economy on land which have considerable interest for all those connected with the marine oil-engine. For instance, the article entitled "How Cost of Pumping Was Halved," relates how the shipbuilding town of Gloucester, N. J., has been able to cut its appropriation for municipal pumping from $40,000 per annum to $19,000 per annum since it changed from steam-power to oil-engines. We recommend our subscribers to make sure of getting *Oil Engine Power* regularly by sending one dollar for a year's subscription in care of MOTORSHIP. The first three issues of that magazine are now entirely out of print, the demand for them having been beyond the publishers' anticipations.

FIRE EXTINGUISHING SYSTEMS ON MOTORSHIPS

While a steamer always has steam at hand for extinguishing fire in any part of the vessel a motorship usually has no steam, as few are equipped with donkey-boilers. It is therefore of considerable interest to note a fire-extinguishing system which has been installed on the Swedish motorship TISNAREN as this is suitable for any motorship. This system provides for fighting the fire with carbonic-acid stored in steel bottles arranged in groups in the engine-room and in two small special rooms. The bottles are connected by piping and by a special system of distributing-valves. From this place piping are led to all holds of the ship that are to be protected against fire. All pipes have a diameter not larger than ½ inch. This is of special importance, as the liquid carbonic-acid in the bottle is held under an enormous pressure; if this pressure is released, when the acid leaves the bottles the danger arises of its turning to ice and congesting in the piping. Now, if the piping is of small diameter, the expansion is somewhat choked, when the acid goes into the pipes; icing only occurs at the mouth of the piping in the cargo hold, where creation of ice is of no consequence. The carbonic dioxide even goes in a liquid state through the piping and expands only at the mouth of the pipe.

The pipe-mouths are lying one at port, the other at starboard side in each hold, about three feet above the bottom level. With this system it is not necessary to suck the air from the upper part of the hold, as the gas, owing to its weight, mostly remains at the bottom, so that the air must escape automatically from the higher parts of the hold.

A trial with the new system, which has been called the "Lux"-type of fire-extinguisher, was made a short time ago in Hamburg. Two bottles, each with 25 kilograms of carbonic acid, were led to hold No. 3 of the ship and within two minutes the bottles were empty. The pipes were frozen at their surface after the trial, but no inside congestion occurred. Calculating the size of the necessary plant is based upon the fact that in a fully-stowed hold about 40 per cent. is air space. So, if a hold is of 40,000 cubic feet, about 16,000 cubic feet of air is contained in it. To fill this up entirely, a quantity of 850 kg. of carbonic-acid would be required. But a mixture of air with 12½ per cent. of carbonic acid is sufficient to subdue any fire.

Actually, most fires are subdued efficiently by a 5 per cent. mixture, only burning gases, such as lighting gas and carbonic-monoxide flames require a larger percentage. Reckoning a considerable quantity for losses, a mixture of 25 per cent. will be well able to extinguish a fire so that only about 210-220 kg. would be ample for a hold of 40,000 cubic feet. A good reserve lies in the fact, that the same amount is provided for the other holds and may be led to the room in question by the distributing system.

This trial in Hamburg proved to be effective and showed that carbonic-acid has a number of very decided advantages in comparison with steam fire-extinguishing; especially valuable is the fact that it has no influence whatever upon any cargo, while steam is rather to be objected to in this respect. Another important feature is that Scandinavian insurance companies have granted a reduction of 0.2 per cent. of the premium for ships fitted with Lux-apparatus, for a period of five years in order to pay the costs of instalment.

OWNERS OF MOTORSHIPS CALIFORNIAN AND MISSOURIAN MAKE ANNOUNCEMENT

The American-Hawaiian Steamship Company and the American Ship and Commerce Corporation, who jointly own the United American Lines which, since 1920, has been Operating Manager of both Companies, makes the following announcement:

Owing to a belief that matters of major importance affecting the Pacific Coast interests should have their consideration centered there, it has been decided to move the operating and traffic control of the American-Hawaiian Steamship Company to the Pacific Coast. Consequently, the United American Lines having no offices on that coast, will relinquish the management of that company and will devote its entire attention to the development of the shipping subsidiaries of the American Ship and Commerce Corporation.

At a meeting of the Board of Directors of the American-Hawaiian Steamship Company held recently W. A. Harriman was re-elected Chairman of the Board, Cary W. Cook of San Francisco was elected President, and J. D. Tomlinson and Henry Dearborn Vice-Presidents. The Board of Directors is:

W. D. Clark	J. H. Post
C. W. Cook	R. H. M. Robinson
H. Dearborn	C. B. Seger
W. A. Harriman	J. D. Tomlinson
R D. Lapham	

The details of the new operating arrangement of the American-Hawaiian S. S. Co. will require some time for complete working out, and in the interim the United American Lines will continue to represent the American-Hawaiian at Atlantic and Gulf ports.

WAGES ON SHIPPING BOARD SHIPS

After several conferences between the representatives of the United States Shipping Board and representatives of the International Seamen's Union with reference to wages and conditions of seamen on Shipping Board vessels, and after thorough investigation by the Board, the following increases in seamen's wages were announced, effective May 14th, with certain changes in working conditions such as the inauguration of the three-watch system instead of the two-watch system and the observance of the eight-hour day in port:

	Old Scale	New Scale
Carpenter	$70.00	$80.00
Carpenter's Mate	60.00	70.00
Boatswain	65.00	75.00
Boatswain's Mate	60.00	70.00
Quartermaster	60.00	70.00
Able Seamen	55.00	62.50
Ordinary Seaman	40.00	47.50
Storekeeper	60.00	70.00
Deck Engineer	70.00	80.00
Pumpman	70.00	80.00
Donkeyman	65.00	75.00
Storekeeper	65.00	.....
Oiler	65.00	72.50
Firemen:		
Oil burner	57.50	65.50
Coal burner	57.50	67.50
Coal passer	50.00	60.00
Wiper	50.00	57.50
Water tender	65.00	72.50

SALE OF GERMAN SHIP

The German motorship PRINCIPIO, engaged in trade between San Pedro and Mexico, was sold at auction on March 25th by the United States Marshal.

GERMAN OIL-ENGINES FOR MERCHANT SHIPS

Continuation of the special article under the above title is prevented this month by the priority that has to be given to cover domestic happenings. The second and concluding part of the article will be published in next month's issue.

TRIAL OF GLOUCESTER BOAT

The trial trip of the auxiliary schooner MORNING STAR, equipped with two 50 b.h.p. two-cylinder Bolinder engines, was run during the latter part of May out of Gloucester Harbor, to sea and back.

Interesting Notes and News from Everywhere

World's Record of New Construction, Ships' Performances and Other Matters of Note in the Motorship Field

BOLINDER, a new Seattle-owned halibut-schooner, is having a 50 b.h.p. Bolinder oil-engine installed.

The American motor-tanker NUUANU left San Francisco for Manila on April 3rd with a cargo of Diesel oil.

Of fifteen cargo ships building at the Deutsche Werft, Hamburg, eleven are to be Diesel-propelled.

The Texas Company has 33 Fairbanks-Morse oil-engines of 30 to 75 b.h.p. operating auxiliaries in its various motor-vessels.

John Brown & Co., of Clydebank, Scotland, will build Sulzer two-cycle Diesel marine engines, as well as Cammellaird-Fulagar opposed-piston motors.

STRATSRAAD LEHMKUHL is the new name of the German-built, oil-engined auxiliary GROSSHERZOG FRIEDRICH, now owned by the Bergen Steamship Co., Bergen, Norway.

Harland & Wolff will shortly start work on a Burmeister & Wain type double-acting four-cycle Diesel marine oil-engine of high power, it is reported.

The installation of the new and higher-powered Diesel engines in the Brocklebank liner MALIA has been completed by Cammell Laird & Co., Birkenhead, England.

It is reported that the name of the big Diesel-driven motor-liner for the Swedish-America Line building at Armstrong-Whitworths is to be GRIPSHOLM.

The 100' halibut fishing schooner SCANDIA, owned by the International & Independent Fishing Company, of Seattle, Wash., is to be equipped with a 160 b.h.p. Bolinder oil-engine.

The Wetzki Works, Elbing, Germany, a shipyard devoted to motorship and motor-yacht construction, recently launched the small motorship RISICO for a Dutch company.

Now completing for sea is the schooner yacht WANDERER, built at Essex, Mass., for R. W. Allen, of New York. She is 110' on the water line, and is being equipped with a 180 h.p. Atlas-Imperial engine.

LIMA, DELAPAN and ANAM are the names of three of the war-time built Bolinder-engined monitors that were converted to oil-tankers and placed in the Dutch West Indian service.

SCOTTISH BORDERER is the name of the 425 ft. Denny-Sulzer Diesel-engined tanker recently launched by Wm. Denny Bros., Dumbarton, Scotland, to the order of Tankers Ltd., London.

The New York Shipbuilding Corp., Camden, N. J., are building the motor-tug for the American Bridge Company, in which a 500 shaft h. p. Winton four-cycle Diesel engine is being installed.

In each of two tugs building at Los Angeles for the Wilmington Transportation Co. (Wrigley gum interests) a 350 b.h.p. Winton four-cycle Diesel engine is being installed.

A 105 ft. wooden mtor-vessel with 150 b.h.p. oil-engines, on twin screws, is being built by Morison & Sinclair, Longnose Point, New South Wales, for the Government of Papua.

We understand that the 8,000 tons cattle-carrying motorship for the Donaldson Line, recently ordered from Vickers Limited, will be a single-screw ship. The airless-injection type four-cycle Vickers oil-engine will develop 3,000 shaft h.p.

In a new pilot boat No. 2 for the Flushing (Holland) service a 200 b.h.p. Polar Diesel-engine is fitted. The vessel was built by J. Smit & Son, Hoogezand, and is 91'9" by 19' by 9'4". Her owners are the Dutch Pilot Service.

Satisfactory trials of the Hamburg-America Line's new 9,000 tons motorship ODENWALD were run by the Deutsche Werft. Twin 1,550 i.h.p. A. E. G.-B. & W. Diesels are installed. Length 398', breadth 54', speed 11 knots.

FULDA is the name given to the German 9,000 gross tons motor passenger-liner building at the Weser Yard, Bremen, in which two 3,000 shaft h.p. Sulzer Diesel engines, 26.77" bore by 47.24 stroke, are being installed. She will carry 870 passengers.

Bolinder 300 shaft h.p. oil-engines will be installed in two cargo-passenger motor-vessels ordered by the Straits Steamship Co., of Singapore, from George Brown & Co., Greenock. It may be recalled that several months ago we suggested that American oil-engine builders should get in touch with this ship-owning company.

Now under construction at Nyack, N. Y. for the Plattsburg Grand Island Ferry Co. of Plattsburg, New York, is a 112' by 26' motor ferry-vessel for the Lake Champlain service, in which a four-cylinder 95 b. h. p. Wolverine oil-engine is being installed. There will be a clutch at each end of the engine for connecting-up the bow and stern propellers respectively.

A 200 shaft h. p. Plenty four-cylinder surface-ignition oil-engine of 13.788" bore by 13.779" stroke turning at 300 r.p.m., has been installed in the 250 tons d.w. coastwise motorship GWENDOLYNNE BIRCH, just built for G. F. Birch & Sons, Fosdyke, England, at Warren & Co.'s New Holland shipyard. The vessel is 105' long, by 21'6" breadth, with 9'1" moulded depth and 8'6" draft.

The Götaverken B. & W. Diesel-engined salvage ship FRITIOF is to be used by the Göteborg Tug & Salvage Co. for the purpose of salvaging the $5,000,000 worth of gold and silver from the strong rooms of the steamship EGYPT, which was lost a year ago in the Bay of Biscay. The vessel lies in 200 ft. of water, and the contractors will get 55% of the value of the salvage.

Of the Boston haddock fishing-fleet, the Diesel-engined trawler FABIA secured the most valuable catches during 1922, earning $110,000. She is a wooden vessel 142 ft. long, and is powered with a 360 b.h.p. Nelseco oil-engine. Her owners are the John Chisholm Vessels Co., Gloucester, Mass., who are proud of the boat and of her economical power plant.

Engines in low powers such as 100, 150 and 200 b.h.p., etc., are now being built by the Pacific Diesel Engine Company, of Oakland, Calif., equipped with both airless and air-injection of fuel. "Both systems work out equally well," say the builder. For simplicity sake most of the marine-type engines of this power are to be equipped for airless-injection.

"Motorships, which use oil in internal combustion engines rather than under boilers, have some points of superiority over the oil-burning steamer, as the latter has over the coal-burner. Through economical use of fuel by the Diesel and similar engines the motor-vessel reduces the cost of operation and gains a greater cruising radius than any other type of power vessel," says the *National Bank of Commerce* in a review on the oil situation.

In a report of the British Merchant Shipping Advisory Committee on Life Saving Appliances the opinion is expressed that on all vessels carrying more than 15 boats it should be made compulsory that one of such boats be a motor-boat fitted with wireless; on all vessels carrying more than 20 life-boats at least two be motor-driven, and all motor-boats should be fitted with searchlights. The British Government has intimated that it is prepared to adopt the report.

Peter Brotherhood, of Peterborough, England, are constructing a small Still-type stationary vertical combination steam-and-oil engine, but have adopted the four-stroke cycle instead of the two-stroke system, which has been advocated by Still. This means that three firms in Great Britain are now constructing under Still license, as the Scott's Shipbuilding & Engineering Co., of Greenock, Scotland, is building an engine of 300 shaft h.p. per cylinder for a large motorship.

A license for the Still patents has been acquired by Plenty & Sons, Ltd., Newbury, England, and the design will be embodied in their existing two-stroke, surface-ignition type of oil-engine that they at present construct for marine and stationary purposes up to 300 shaft h.p. in six cylinders. In the new type of engine it is proposed to build units having a cylinder capacity of 125 b.h.p., whereas their present oil-engine has a capacity of 50 b.h.p. per cylinder. The general design of the engine will closely follow the company's present oil-engine design, augmented on the under side by the steam obtainable with the Still system.

U. S. Steel Corporation First Motorship

Launching of the "Steelmotor"—Powered with a 750 s.h.p. McIntosh and Seymour Diesel Engine

PROMPTLY at 11:30 a. m., May 18th, the first of two steel motorships under construction for the United States Steel Products Company at the yards of the Federal Shipbuilding Co. was successfully launched, Mrs. C. O. Holmes, wife of the Manager of the Structural Steel Department of the United States Steel Products Company, acting as sponsor. Mrs. Holmes was accompanied by her husband, and by E. P. Thomas, president of the United States Steel Products Co., Louis Pfeiff, traffic manager, and Mr. and Mrs. L. H. Korndorff, vice president of the Federal Shipbuilding Company.

The STEELMOTOR, as she is named, is an exceptionally interesting ship in many ways, typifying the confidence which is being rapidly established in oil engines as the ideal power-plant for cargo ships. This new vessel is 250′ long by 42′9″ beam with 20′ draft, and is powered with one McIntosh & Seymour 750 H. P. Diesel engine. All auxiliaries are electrically operated, and there are two large revolving cranes operated by Brown hoists for handling exceptionally long pieces of fabricated steel. J. C. Craven was her designer.

STEELMOTOR and her sister ship will be operated by the United States Steel Products Co., principally between Montreal and Chicago during the months of open navigation on the Great Lakes, and these ships are especially designed for carrying exceptionally long pieces and heavy pieces of fabricated steel which would otherwise be hard to transport by rail. In the winter time it is planned to operate them in the West Indies Trade.

A Pacific Coast Shipowner Discusses Diesel Power

Interview with H. F. Alexander, President of the Admiral Line, Seattle

H. F. Alexander, president of the Admiral Line, Seattle

PACIFIC coast transportation men have always had the reputation of being among the most progressive in the country, and in keeping with this reputation have been among the first to perceive the advantages of Diesel engine power for marine purposes and to recognize its coming supremacy in the field of ocean transportation. The Pacific coast boasts of having some of the largest companies operating steamships under the American flag and the biggest of these is the Pacific Steamship Co.—the Admiral Line, which operates a total of more than forty vessels in the Alaska, coastwise and Oriental trade, and its flag is known in every port in the world. At the head of this company serving as its president and managing director is H. F. Alexander.

In view of the importance of his company in the transportation field and of Mr. Alexander's prominence as a national figure in shipping circles, his opinions on future motorship development are interesting. To a representative of this magazine he expressed himself freely and without reservation as being convinced that the day of the motorship is at hand.

"I believe that the steamship for ocean cargo-carrying is soon to become a thing of the past," said Mr. Alexander. "In fact, I will be much surprised if there are any more new keels laid for steamships by the larger transportation companies from now on. Were it not for the government vessels and steam plants that are being sold so far below cost, I think I could go farther than this and say that there would be no more steam-propelled freighters added to any of the big American cargo-carrying fleets.

"To prove our own belief in this policy, I might state that we are already laying our plans for developing a fleet of motor freighting vessels. We have purchased four three thousand-ton wooden hulls, the MOONLITE, DAYLITE, DAWNLITE and SUNLITE, and also the motorship BENOWA. The first four vessels were of the auxiliary type, but are not now equipped with power. We plan to convert them all into full-powered motorships, and as the first step in this program we will dismantle the motorship BENOWA, which we purchased entirely on account of the value of her machinery, and install her twin 500 h.p. McIntosh & Seymour Diesel engines in the MOONLITE. The other boats will be similarly equipped later, although our plans as to the power plants for these have not yet been matured. We intend using these vessels in the coastwise and Alaska freighting business.

"As regards our passenger vessels, our program does not reach so far into the future as to comprehend plans for vessels of this type, owing to the fact that we recently purchased from the government several fine steamships, including the H. F. ALEXANDER, formerly the NORTHERN PACIFIC, and the RUTH ALEXANDER, which are now handling in a very satisfactory manner our Puget Sound-California service. I was very much interested, however, in the recent announcement in MOTORSHIP of the plans of the Union Steamship Co. to build an 18-knot, 20,000-ton motor passenger vessel for their trans-Pacific trade from Vancouver to Australia, and you may be sure that we and other transportation companies will watch the outcome of this vessel with a great deal of interest, for we believe that the motor passenger vessel, like the freighter, is an inevitable development and one very near at hand.

"You can quote me as being a firm believer and an enthusiast on the future of the motorship, and may say that the Admiral Line will be among the first to take fullest advantage of the economy which this type of power promises to make possible in the field of future ocean transportation of all kinds."

TRANS-PACIFIC CRUISE OF DIESEL YACHT "OHIO"

The Diesel motor-yacht OHIO, owned by E. W. Scripps, and built by the Newport News Shipbuilding & Dry Dock Company from designs by and under the supervision of Cox & Stevens, has recently completed a trans-Pacific voyage in a remarkably short time, and in view of her moderate size this is a noteworthy performance. The OHIO left San Diego, Cal., on March 8th, and arrived at Honolulu on March 18th after a pleasant and successful voyage. She sailed from Honolulu on March 26th and arrived at Yokohama on April 7th.

The OHIO is 172 ft. in length, has a beam of 26 ft., a draft of 11 ft., and is equipped with two 350 h.p. Winton oil engines.

It is indeed a distinct advance in reliability of machinery and in strength and seaworthiness of construction when a vessel of these relatively small dimensions can successfully and with comfort to those on board undertake so long a voyage. The OHIO is unquestionably a forerunner of many other sensible cruising seagoing pleasure craft.

TWIN-SCREW MOTOR-YACHT "ISABELLA"

Intended for cruises to the West Indies as well as for general use on the coast the Diesel-yacht, ISABELLA, is nearing completion at the yard of Smith & Williams, Salisbury, Md., for Harrison N. Diesel. J. Murray Watts is the designer, and she will be propelled by two 80 h.p. four-cylinder Mianus-Leisner oil-engines, which will give her fair cruising speed, turning 36″ by 46″ Hyde propellers at 410 r.p.m. These engines are installed in a room about 14′ square just forward of amidships, and in addition there is a 7½ h.p. Mianus engine driving an air-compressor and a 5 k.w. 110-volt electric generator which furnishes current for electric lights, 2,000 c.p. searchlight, sanitary pumps, Kelvinator ice-making and refrigerating plant and electric capstan. The ISABELLA is 68′ length, 15′ breadth and 3′ 6″ draft.

The general arrangement shows a 17′ deck saloon, three large staterooms below decks, together with most complete bath rooms and galley 7′ by 12′, containing four-hole range, hot-water heater and boiler. She is most strongly constructed with hull double planked with mahogany over selected oak frame. The finish is African mahogany. The engine beds are mounted on keelsons extending the full length of the boat and the floor timbers in the way of the engines are 6″ oak. To reduce the noise of the engines in the owner's quarters there is a soundproof bulkhead sheathed with iron plating on the engine-room side.

SOME MORE ATLAS-IMPERIAL INSTALLATIONS

LOUIS, a new 60′ work-boat just built for Mr. Erickson, of Astoria, Oregon, by Wilson Bros., has had a 65 b.h.p. Atlas-Imperial oil-engine installed.

A 55 b.h.p. Atlas-Imperial engine has been installed in a fishing tug at Erie, Pa.

Now nearing completion is the little freighter SOUTH SHORE owned by the South Shore Transportation Company, San Francisco. In this boat a 90 b.h.p. Atlas-Imperial Diesel engine is being installed.

The San Pedro Transportation Company has just installed the fifth Atlas-Imperial Diesel engine in their fleet of ferries and passenger boats. This is a 65 b.h.p. set.

JUNIOR, a fishing tender owned by the San Juan Fishing Company, at Seattle, has had a 90 b.h.p. Atlas-Imperial Diesel engine installed, while a 65 b.h.p. set has been shipped to New York for installation in a tug. Also a 55 b.h.p. Atlas-Imperial Diesel engine has been shipped to Blum & O'Neill at Cordova, Alaska.

In a fishing tug at Vancouver, B. C., Ferrier & Lucas are installing a 65 h.p. Atlas-Imperial engine.

One of the most important Atlas-Imperial installations now under way is that of a twin 150 b.h.p. set in the new coastwise freighter OAKLAND under construction at Frank Stone's shipyard.

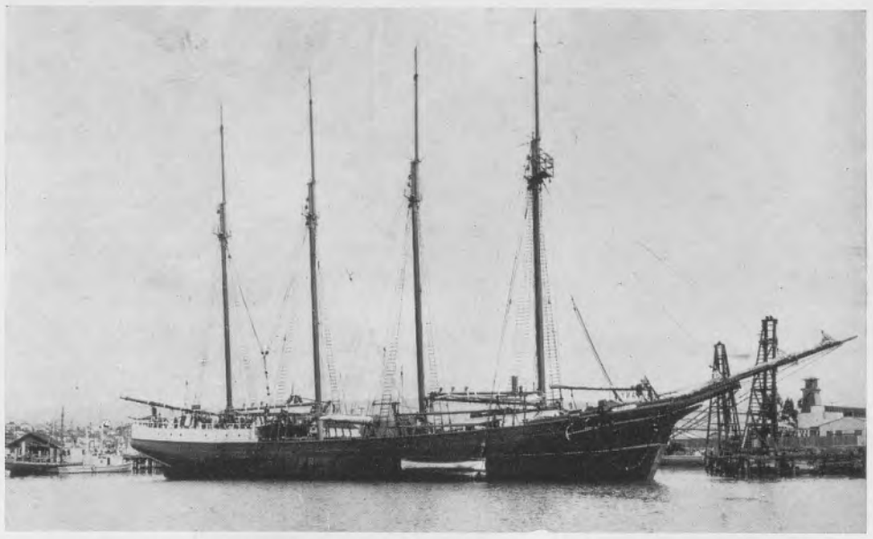
OIL-ENGINED CRUISERS FOR CANADIAN FISHERY PATROL

Tenders have been called for two 60′ oil-engined craft for fishery patrol on the British Columbia coast, while plans and specifications are being drawn up for the 57-footer with oil-engines for the Forestry Branch of the Dept. of Lands, Canadian Government. These three vessels will be the first to be operated by these departments on the Pacific coast; their present craft being either steam-driven or gas-engined.

Specifications of the boats for the Department of Marine and Fisheries call for 60′ length, 14′ breadth and 5′9″ draft. They are to be constructed of British Columbia fir. The specified speed is 9 knots and a 55 h.p. Diesel engine will be installed.

J. Winslow is drawing the plans for the cruiser for the Forestry Branch of the Department of Lands and she will be 57′ o.a., 13′ breadth and 5′ draft. In this boat a 50 b.h.p. Washington-Estep airless-injection type oil-engine will be installed. It is a two-cylinder, four-cycle model. Fuel-tank capacity for 1,000 gallons of oil will be provided.

"G. & W.," a motor-ferry at San Pedro powered with a 80 b.h.p. Atlas-Imperial Diesel engine. Exhaust gases run up the hollow steel mast



H. Liebes & Co. of San Francisco, auxiliary "Arctic" equipped with a 350 shaft h.p. Atlas-Imperial Diesel engine

CONVERSION OF THE SCHOONER "CHUKOTSK"

Among vessels engaged in Siberian trading for some years is the schooner CHUKOTSK, owned by O. Swenson, which prior to being placed in this trade was known as the TYEE. She was powered with a 140 b.h.p. Frisco-Standard distillate engine which gave good service, but her owner decided to install an engine that would consume cheaper oil. So he placed an order to change the power of this vessel to a Frisco-Standard surface-ignition oil-engine of 110 b.h.p. at 300 r.p.m. The CHUKOTSK is a wooden vessel of 103′ length on the water line, 21′ breadth and 11′ depth.

OIL-ENGINE POWER IN RIVER-BOAT "MI DUENNA"

Reliability and economical performance have been the principal characteristics of the river boat MI DUENNA, owned by the Napa Transportation Company of San Francisco, since they had her power changed to a surface-ignition oil-engine. This boat is used in river service along the Sacramento from Rio Vista through the mouth and across San Francisco Bay to the city of San Francisco. As her chief freight is farm products, which must arrive on schedule to be sold in the market, reliability of performance is very important, otherwise her owner would face serious loss. At the time of writing the boat has been in operation six weeks, but has not missed a single mark. Formerly her fuel bill per single round trip from San Francisco to Rio Vista and back, stopping at freight wharfs along the river, amounted to $50 with distillate fuel, but with the new heavy-oil plant her fuel bill is only $6.

The MI DUENNA is a wooden boat 65′ long overall, 24′ breadth and 4′6″ draft. She is flat bottomed and her original 80 b.h.p. engine drove her at 7 knots. Her new power-plant consists of a 100 shaft h.p., four-cylinder Frisco-Standard oil-engine turning a 50″ diameter by 35″ pitch Standard bronze propeller at 340 r.p.m. For auxiliary purposes there is a 5 h.p. gasoline engine driving a Rix compressor for emergency starting air. The starting air for maneuvering is carried in a storage tank fed by means of compressor driven off the main engine. "It has been found possible," says Capt. E. H. Warren, "to obtain a normal speed of 8½ knots."

OIL ENGINES IN SHEEPSHEAD BAY CRAFT

(*Continued from page* 413)

engine is being installed is the COMANCHE, owned by Capt. Joseph Morvach. She is 46′ long, 15′ breadth and of 14 tons, and will be propelled by a 65 h.p. Diesel engine, which replaces a 70 h.p. gasoline engine.

Capt. Gus Rau is having constructed by the Nyack Shipbuilding Corp. of Nyack, N. Y., a party fishing boat 80′ 0″ long, 17′ 0″ breadth and 5′ 6″ draft. A 100 h.p. Fairbanks-Morse oil-engine is being installed which will drive her about 9 knots. Retallack & Buckner have installed a 60 h.p. Fairbanks-Morse engine in their party fisherman CAPT. JOE II, which is 65′ 0″ long, 15′ 0″ breadth and 4′ 9″ draft.

It is clearly evident from the activity on this busy waterway that the future of oil-engines is assured both in this section and in the fishing fleet. The economy and reliability of this better power are rapidly becoming widely known, and it requires but a few installations in a given community for rapid progress to be made toward a complete change of power.

Our Readers' Opinions

(The publication of letters does not necessarily imply Editorial endorsement of opinions expressed)

POWER PLANT ENGINEER VISITS MOTOR CRAFT

To the Editor of MOTORSHIP:

The motor-yacht VELERO II, Winton Diesel electric driven, was in port (Mazatlan) the other day, and through the courtesy of her owner, Captain G. Allen Hancock of Los Angeles, I boarded her and was shown over the beautiful vessel by her wireless officer. After a thorough inspection I can truthfully state that it would be an impossibility to equal her comfortable, well-appointed cabins and social hall on a steam yacht of 50′ greater length.

In my talk with Mr. Pike, her chief engineer, I was informed that the Wintons were giving a truly remarkable service (considering the fact that this is the first oil-engine installation the engineers have ever operated), as they were taken directly off the gas-engined yacht VALERO I and put in charge of this Diesel installation. All maneuvering is carried out from the pilot house, this simplifying the engine-room work to equal that of a stationary job.

A few days previously the motor-yacht OHIO touched port here on her way to Frisco from the east coast.

I wish to call your attention to the M. S. WILLIAM DONOVAN, No. 749 in the Yearbook. She is listed as having one 450 Diesel, whereas she has two 500 h.p. Wintons. I know, as I spent a pleasant "port watch" aboard her at San Pedro with "Old Dad," one of her assistant engineers.

Best of luck with your journal.

E. W. BERRY.

Diesel Engine Power-Plant Efficiency Engineer, El Arco Mines Co., Copala, Sinaloa, Mexico.

COST OF DIESEL MACHINERY

To the Editor of MOTORSHIP:

In your April issue under the title, "A Misleading Comparison," you presented a criticism of my article which appeared in the January issue of "Marine Engineering." In connection with this editorial I would like to call your attention to a few facts.

1. The shaft horse-power used in my article was 2,910 (line 6, Table I.) and not 1,750 as stated in your editorial. Evidently the writer of this editorial did not read my article carefully for the *effective* horse-power was given as approximately 1,750 and the shaft horse-power as approximately 3,000.

2. This misunderstanding regarding the shaft horse-power on the part of the writer of the editorial caused him to conclude that the Diesel installation is too heavy, too expensive and occupies too much space. The weight given in Table I., line 22, of my article for the total Diesel machinery is 580 lbs. per shaft horse-power. This weight is slightly smaller than the published weights for the WILLIAM PENN, CALIFORNIAN, etc. An installation of 2,910 s.h.p. on this basis would weigh 755 tons as stated. Certainly few merchant ship installations are lighter than this.

3. The length of the machinery compartment is given as 55 ft. which agrees closely with existing installations of 3,000 s.h.p.

4. The costs given in my article were carefully checked at the time of publication and you will find that they agree very closely with current estimates. Costs are always open to considerable variation and difference of opinion and an example was given in the article showing the influence of reduced costs of Diesel machinery on operating expenses.

5. Your statement regarding a single screw installation is, of course, without point as the installation you criticized is for 2,910 s.h.p. and not 1,750 as stated in your editorial. A twin-screw installation is decidedly favorable to the motorship and as I wished to make the comparison as fair as possible I adopted it. Line 4, Table I., shows that the twin screw installation has the higher propeller efficiency and due to the higher r.p.m. used with twin screws the engines would be lighter and probably cheaper.

All the statements and conclusions in the editorial are based on the misunderstanding of the true shaft horse-power. Your last sentence makes this conclusive.

Very truly yours,

S. B. CHAPMAN.

Bethlehem, Pa., April 11, 1923.

[We are pleased to give space for Professor Chapman's comments.—EDITOR.]

WE ALWAYS STRIVE FOR ACCURACY

To the Editor of MOTORSHIP:

The information you published regarding our motorship JULES HENRY is quite accurate.

A. VIMONT & CO.

Marseilles, France.

MAY CONVERT STEAMERS TO DIESEL POWER

To the Editor of MOTORSHIP:

We are following very closely the question of motorizing steamers, and it is very probable that we shall do something along these lines before the present year is out. We read with considerable interest MOTORSHIP.

THE BALTIMORE STEAMSHIP CO.,
A. J. Townsend, Vice-Pres.

Baltimore, Md.

WHERE OIL-ENGINE POWER IS NEEDED

To the Editor of MOTORSHIP:

Here is a field on the "Great Lakes" that so far has not been converted to Diesel engine power—though requires it. Where United States Government mail carrying boats under season price basis contract are steam vessels, they are not getting renewals of contracts. Auto bus lines and small gasoline launches are getting the business.

It is said that the steamer ELVA, which for years has had the mail contract for the St. Mary's River, from Soo, Mich., to Detour, will not get the contract renewed at the figures they bid. The ELVA is of 81 gross tons, built of wood, keel 71′, beam 18′, depth 16′ 6″, and carries freight, passengers and mail, making daily trips. She has fore and aft 10-18 × 12 steam engine, with one Scotch boiler 6′×8′. The contract for ELVA is to be renewed July 1, or given to some other boat.

Here is a fine trade for a small Diesel vessel that can carry passengers. There is a steady traffic from Detour to Soo and reverse, and excursions to islands of river and summer homes thereon during June to October, besides freight and mail.

Another instance where coal-burning steamers cannot retain mail contracts is that of the Arnold Line, which carried mail for years from Mackinac Island to the Snows and mainland thereabout. They did not get renewal of contract for mail haul with their steamer ISLANDER, and—result—service by boat will be discontinued.

All over the United States this condition must exist. The writer refers to these two incidents he knows of because every year he goes north to Soo or along St. Mary's River and stays three months.

Anyway here is a theme.

ALFRED C. JACKSON.

Detroit Terminal Wharf and Warehouse, Detroit, Mich.

DIESEL ENGINES IN SUBMARINES

To the Editor of MOTORSHIP:

Attached please find clippings from local papers which seem to me to be a slander of American-built engines. We all know the ability of our Army and Navy officers to "pass the buck" whenever they fall down on the job. Perhaps MOTORSHIP will place the blame where it belongs and exonerate our engines. GEORGE L. BULL.

3721 Magee Ave., Oakland, Calif.

[*The clippings forwarded by Mr. Bull refer to the 540 tons displacement submarines operating with a fleet off Panama. In one clipping Comm. Fred. C. Sherman, U. S. Navy, is reported to have stated that the submarines had to cruise 2,000 miles before getting to the point where the maneuvering started, which meant hours of wear and tear on both the men and machinery; that the engines were not thoroughly reliable during the maneuvers; also that the men were suffering from lack of fresh food and water, the double shifts in the engine-room due to engine troubles and other trying conditions. Such was the untiring spirit of the men that the submarines in their operations won praise from Admiral E. W. Eberle, commander of the battle fleet.*

In the other clipping Comm. F. C. Sherman is reported to have declared that the submarine service of the U. S. Navy is suffering from defective material and that it has never been possible to manufacture in this country Diesel engines that come up to the standard of those manufactured in Germany.—EDITOR.]

WE APPRECIATE YOUR INTEREST!

To the Editor of MOTORSHIP:

I greatly appreciate your very much alive MOTORSHIP and will continue my subscription wherever I may be.

W. SMART.

95 Queen Victoria Avenue,
Barrow-in-Furness, England.

ITALY AND SHIP CONSTRUCTION MATERIAL

To the Editor of MOTORSHIP:

I have pleasure in advising you that all raw materials to be used in the construction of ships and other machinery are now admitted free of customs duty into Italy. After June 30, 1926, all accessories will also be admitted free of duty. I do not know whether the facilities so far granted will be of any help to American firms.

J. H. BARBOUR.

Publicity Agent, "La Marina"
via Alla Nunziata 18, Genoa, Italy.